STATE OF CALIFORNIA
The Resources Agency

Department of Water Resources

BULLETIN No. 69-70

CALIFORNIA HIGH WATER
1969-1970

AUGUST 1971

NORMAN B. LIVERMORE, JR.
Secretary for Resources
The Resources Agency

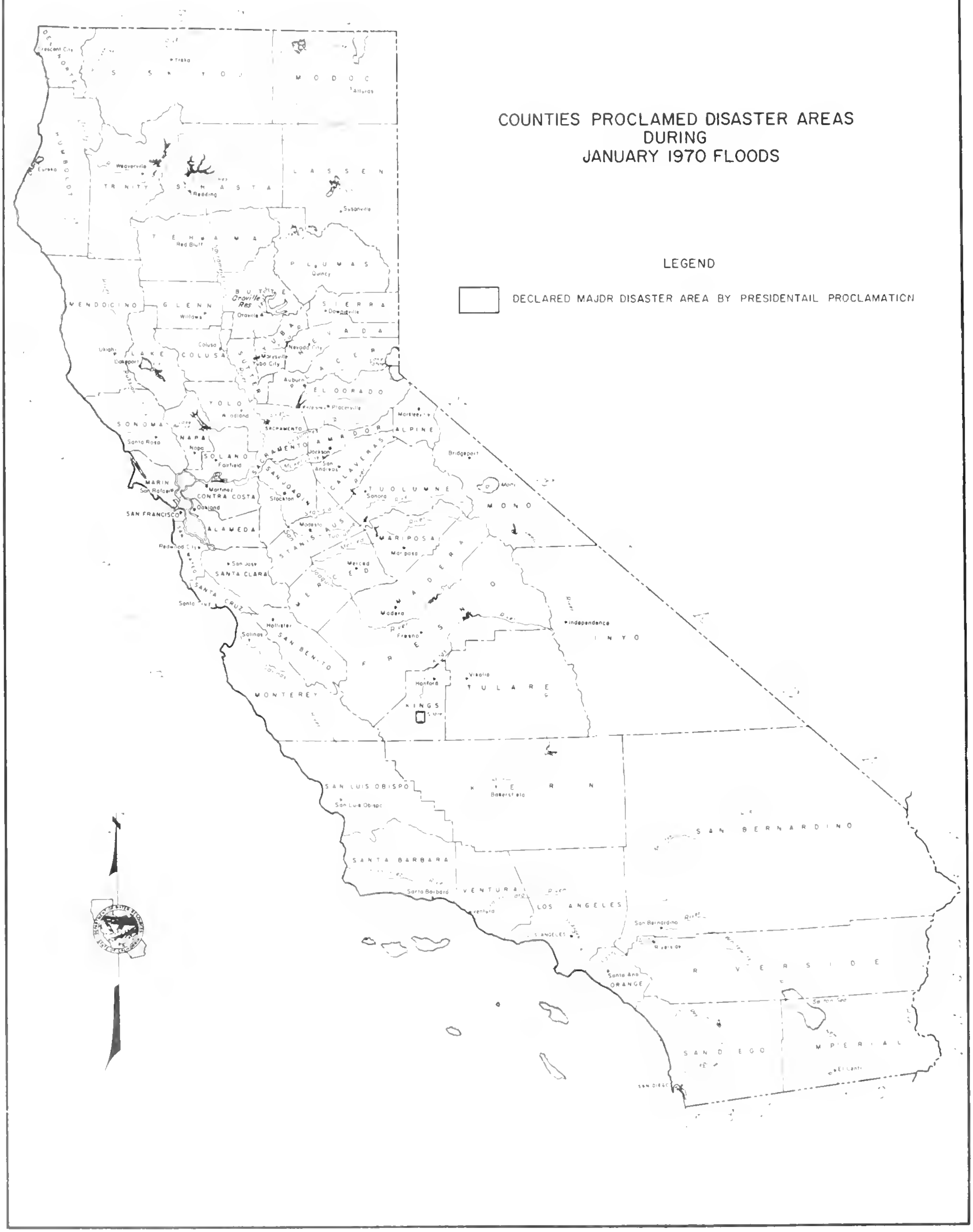
RONALD REAGAN
Governor
State of California

WILLIAM R. GIANELLI
Director
Department of Water Resources

COUNTIES PROCLAMED DISASTER AREAS DURING JANUARY 1970 FLOODS

LEGEND

DECLARED MAJDR DISASTER AREA BY PRESIDENTAIL PROCLAMATICN



State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES

RONALD REAGAN, Governor
NORMAN B. LIVERMORE, JR., Secretary for Resources, The Resources Agency
WILLIAM R. GIANELLI, Director, Department of Water Resources
JOHN R. TEERINK, Deputy Director

Division of Resources Development

Herbert W. Greydanus . . . . Division Engineer

William L. Horn . . . . Chief, Flood Forecasting and Operations Branch

This report was prepared under the immediate supervision of

Donald H. Neudeck . . . . Chief, Flood Operations and Flood Control Maintenance Section

by

William A. Arvola . . . . Meteorologist III

Dale E. Martfeld. . . . . .Associate Engineer, Water Resources

William B. Chan . . . . . Assistant Engineer, Water Resources

Jess C. Bringham . . . . Water Resources Technician I

George W. Patrick . . . . Water Resources Technician I

William McKane . . . . Senior Delineator

Liz Freitas . . . . Stenographer II

FOREWORD

Bulletin No. 69-70, the eighth of an annual series, describes, in one report, the general weather patterns, preceding and during storm periods of the 1969-70 water year, precipitation characteristics, and the resulting runoff, and presents information on flooded areas. In addition, tabulations of precipitation comparisons, peak streamflows, and stages, reservoir operations, and streamflow hydrographs are also included.

Data for this Bulletin were supplied by the National Weather Service, U. S. Geological Survey, U. S. Army Corps of Engineers, U. S. Bureau of Reclamation, and many other agencies, both public and private. Their cooperation is gratefully acknowledged.

William R. Gianelli
William R. Gianelli, Director
Department of Water Resources
The Resources Agency
State of California
June 30, 1971

ABSTRACT

Most of the precipitation during the 1969-70 water year fell in December 1969 and January 1970. / Above-normal January rainfall affected the northern half of the State with many stations reporting two to three times the normal for the month. / Several stations reported the warmest or second warmest temperatures of record. / Precipitation totals for the three-day period of January 21-23 were especially heavy. / Runoff in the North Coast ranged between 400 and 600 percent of normal on the many streams in the area. / Streams in the North Coast area responded to each burst of rain with rapid rises in stages. / Mudslides were prevalent throughout the North Coast area closing roads and causing general inconvenience in the area. / A wall of water 1,000 feet wide passed through the community of Fort Jones after a period of heavy rainfall. / Parts of Marin County and the East Bay Counties were subjected to flooding and mudslides. / January precipitation in the Sacramento Valley ranged between 200 and 350 percent of normal. / The heavy January rains caused peaks of record at several locations along the Sacramento River. / Runoff in the Sacramento Valley ranged from 500 percent of normal on the Sacramento River to 600 percent of normal on the Feather and Yuba Rivers. / Flood damage in the Sacramento River Basin was ranked as the third most destructive in the record flood history of the area. / Shasta and Oroville Dams along with the other dams in the northern part of the State held back the flood waters and averted major damage. / Inflow into Shasta Lake peaked near 210,000 cfs, the highest inflow of record. / Releases from Keswick Dam were increased to 79,000 cfs, the maximum allowable under flood control regulations, for the first time since 1958. / Several towns were partially inundated by the flood waters in the North Coast area and in the Sacramento Basin. / The Governor proclaimed seventeen counties disaster areas because of flooding and mudslides. / After the January storms, the precipitation for the rest of the year was generally below-normal which resulted in the yearly precipitation to be near normal. / Storage in 121 major reservoirs in California at the end of the water year was approximately 111 percent of the average ten-year carryover storage.

COVER PHOTOGRAPH

Courtesy of The Sacramento Bee

Heavy spillage over the North Fork Dam on the American River near Auburn creates a wild river.

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Daily briefings in the Joint State-Federal Flood Operations Center keep Flood Forecasting and Operations Branch personnel abreast of the constantly changing weather picture.
DWR Photograph.

THE WEATHER OF WATER YEAR 1969-70

During the water year 1969-70 most of the precipitation fell during two major periods -- in December 1969 and in January 1970. The precipitation in December affected Northern and Central California, bringing the first rises of the rivers of Northern California, but the main effect was to wet the basins for the heavier precipitation which followed in January. The rainfall in December broke a drought which had begun the previous March. Mount Shasta City in Siskiyou County had the seventh wettest December since 1888, and Sacramento had the wettest December since 1955.

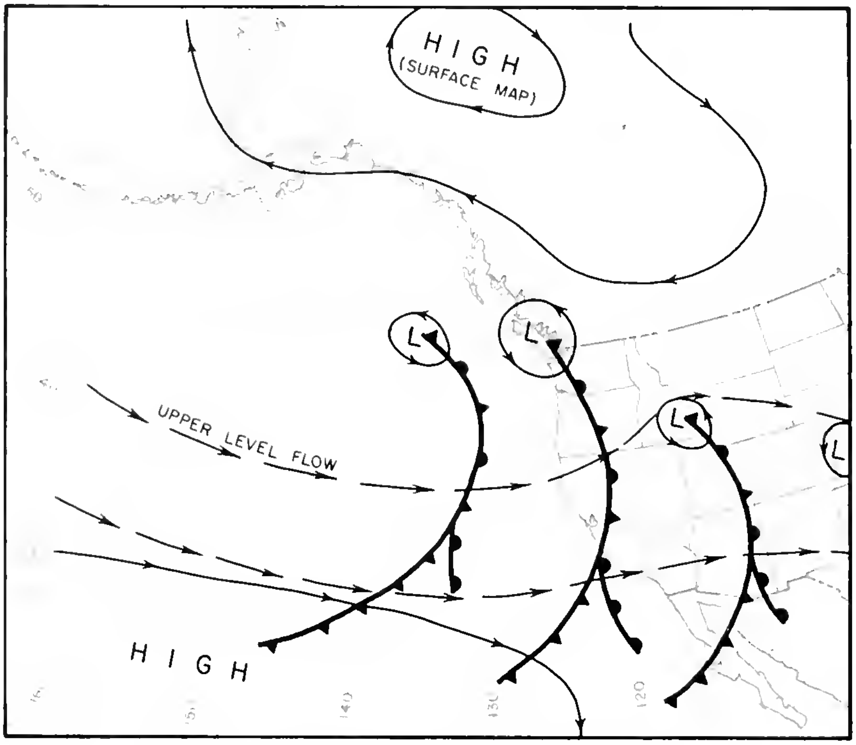
Abundant rainfall in January 1970 was again the description of the weather in California for the second consecutive January. The above-normal rainfall affected the State from the Oregon border to the Central San Joaquin Valley. Many stations received two or three times the normal amount for the month. This January 1970 differed from January 1969 in that the heavy rainfall in 1970 was located in Northern and Central California, whereas in 1969 the southern part of the State received the heavy accumulations.

The precipitation generally covered about a 20-day period from the 7th to the 27th of the month. Although the precipitation was distributed through this period, there were two or three principal time concentrations.

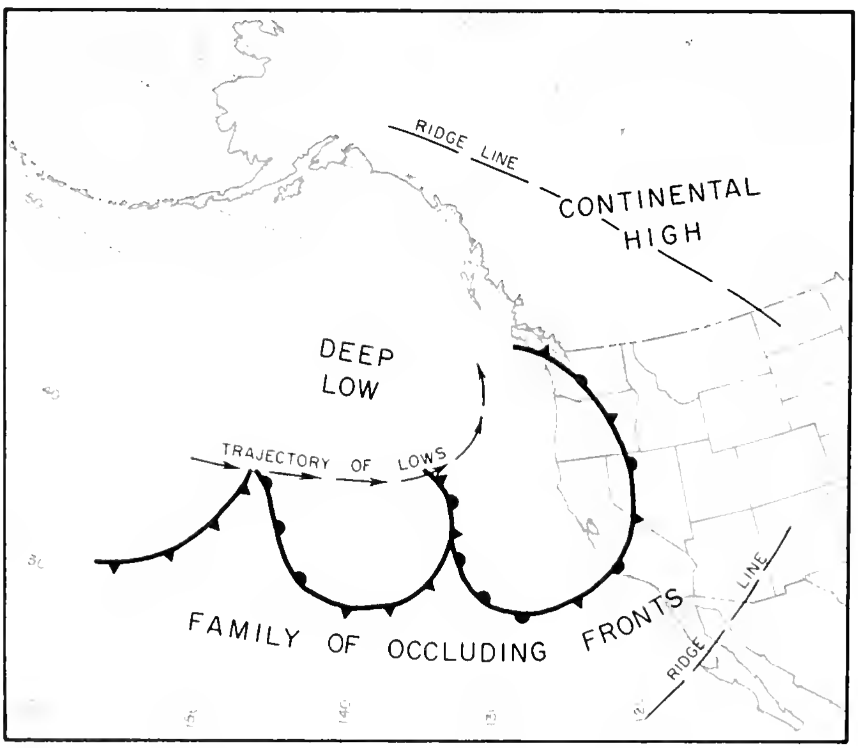
The overall flow pattern over the eastern Pacific and western states was zonal. In a zonal pattern there is little amplitude in the meander of the current blowing through the troughs and crests on the upper level charts. (The opposite flow pattern with large amplitude is called meridional.) The belt of the strongest westerlies aloft in January 1970 was displaced southward about 10° of latitude from the normal January position. During the 20-day storm period, eight weather fronts affected California, with a front of a quasi-stationary character at the Oregon border on the 22nd and 23rd bringing a significant time concentration of heavy rain.

The zonal flow pattern brought warm air masses over the State; many stations reported the warmest or second warmest temperatures of record. Analysis of sea-surface isotherms in the eastern Pacific Ocean indicated that there were large areas of warm water north of Hawaii with the anomaly as much as +4°F. This warm water undoubtedly contributed to the vigor of the storm activity and supplied heat and moisture to air masses being carried toward the Pacific Coast.

In an effort to catalogue the weather pattern of January 1970 it is of interest to apply some of the weather typing techniques. Using the weather types developed at the California Institute of Technology[1], the type most frequently occurring in the period January 7-27 was the Type E_M. This type is a zonal flow type with little amplitude of the upper-level trough-ridge pattern. The upper level westerlies are displaced southward in the eastern Pacific. A sequence of weather fronts move into the states from the Pacific with a tendency for storm centers (lows) to move southeastward in the Rocky Mountain area because of their being deflected by Canadian high pressure centers. These highs move through the Great Lakes area after each front moves to the eastern seaboard. Precipitation with the E_M type is above normal on the West Coast, especially in Northern California. Temperatures are mild in the west, but below-normal in the northern Great Plains and Great Lakes regions.

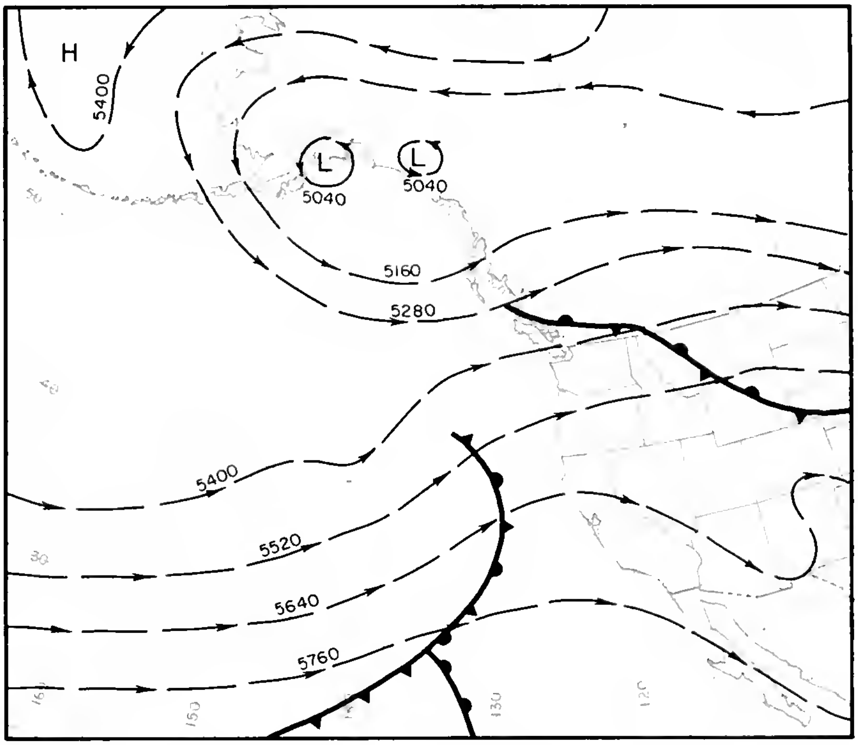


SCHEMATIC WEATHER MAP SHOWING THE WEATHER TYPE E_M ACCORDING TO THE CIT TYPING SYSTEM (after ELLIOTT, 1949)

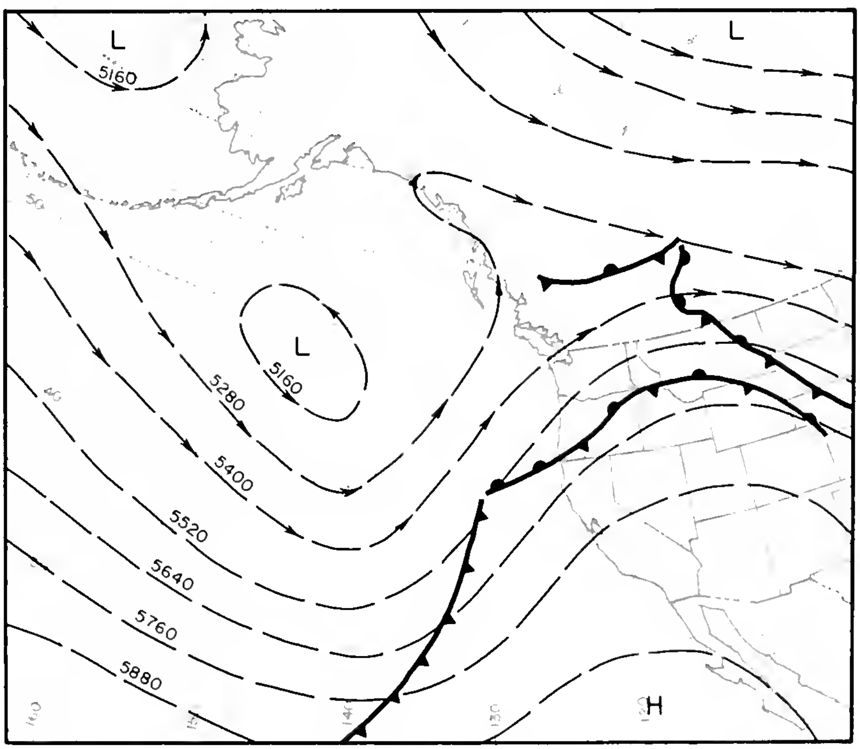


SCHEMATIC WEATHER MAP SHOWING THE MID-LATITUDE SOUTHWESTERLY STORM TYPE (after WEAVER, 1962)

SCHEMATIC MAPS OF WEATHER TYPES



WEATHER MAP FOR JANUARY 13, 1970 AT 0400 PST SHOWING 500 mb CONTOURS (DASHED LINES, LABELLED IN METERS) AND FRONTAL SYSTEMS (MARKED WITH TRIANGLES AND HALF CIRCLES ACCORDING TO THE CONVENTIONAL PRACTICE)



WEATHER MAP FOR JANUARY 23, 1970 AT 0400 PST SHOWING 500 mb CONTOURS (DASHED LINES, LABELLED IN METERS) AND FRONTAL SYSTEMS (MARKED WITH TRIANGLES AND HALF CIRCLES)

WEATHER MAPS FOR JANUARY 13 and 23, 1970

If we use weather typing developed by Robert L. Weaver of the National Weather Service[2,3] the pattern of 1970 would best fit into the category Mid-Latitude Southwesterly Type. This is a zonal type with storm systems moving in a westerly direction at middle latitudes over the Pacific, but entering California more from the southwest. A series of occlusions, spaced fairly closely together, move in the general westerly flow across the eastern Pacific. On entering the Continent, the fronts impinge on a continental high in western Canada, but remnant low pressure systems may break through the Great Basin and into the Middle West. This weather type is very similar to the Type E_M of the CIT typing system. The weather types discussed above are shown schematically on Plate 2.

The wet period began with a front--a cold occlusion--moving into California on January 7. The precipitation which accompanied this front brought the first rise of the rivers in the northern and central part of the State in January. Other fronts moved in fairly rapid succession in the following 20 days. The cold front of January 13-14 brought a significant concentration of precipitation with many mountain stations with favorable orographic exposure collecting as much as 4 to 5 inches in one 24-hour period. Another vigorous front closely followed on the 16th and brought a concentration which was heaviest at stations in the center part of the State. Examples of this are 4.5 inches on the 16th at Venado in the Russian River Basin, 4.34 inches at Blue Canyon in the Central Sierra, while Shasta Dam reported only 1.4 inches for the 16th.

A weak front on the 19-20th maintained the continuation of a wet period. A strong occluded front moved into the Pacific Northwest on the 21st, and by the 22nd it had moved into the northern Rockies with the cold front of the system trailing westward through southern Idaho to the California-Oregon border. This cold front became quasi-stationary at the border on the 22nd and 23rd with an orientation WSW-ENE, parallel to the WSW flow at the upper levels of the atmosphere. The California weather reporting stations were south of the front with a warm air mass present; temperatures of 60°F were reported at Eureka and Red Bluff. This was the warmest period of the January storm series; many stations reported the highest January daily minima of record (San Francisco, Sacramento, Red Bluff).

At the northern end of the Sacramento Valley, the precipitation totals for the 3-day period January 21-22-23 were especially heavy, such as 11.7 inches at Shasta Dam, 9 inches at Vollmers, 10 inches at Lakeshore, and 14 inches at Pit River Power House. Although these amounts do not exceed the 10-year values[4] for those locations, the precipitation resulted in a record inflow into Shasta Reservoir because the rainfall concentration followed on a wet antecedent condition of the previous 13 days.

The quasi-stationary front of the 23rd finally moved as a cold front into the southern part of the State on the 24th ending the heavy concentration of precipitation. A final cold front on the 27th brought some more rain on the 26-27th to end the 20-odd day siege of January 1970.

Weather maps for two days in the January storm series are shown in Plate 3. The top map depicts the cold front which moved into the State on January 13, and the bottom map depicts the quasi-stationary front of January 23 which brought a significant concentration of precipitation to the Upper Sacramento River Basin.

During the early part of the January storm series--from the 7th to the 11th --the snow level was about 3,000 feet at the northern end of the Sacramento Valley with snowfall reported at Min-

eral (elevation 4,911 feet) and at stations on the floor of Shasta Valley. From the 12th to the 18th, the snow level lifted to 5,000 feet in the area above Shasta Dam and 6,000 feet in the Central Sierra. Mineral reported no snowfall in this period; Blue Canyon also reported none, except on the 14th with the passage of the cold front.

Further warming during the period 19th through the 23rd brought a lifting of the snow level to near 8,000 feet in the north, and about 9,000 feet in the Central Sierra. No snowfall occurred at Manzanita Lake (elevation 5,850 feet) near Lassen Peak or at Soda Springs 1E (elevation 6,885 feet) in the Central Sierra. This period of the 19-23 was the warmest of the January storm series, and it was during this period when the heaviest rain fell. The final periods of precipitation which came after the passage of the cold front on the 24th occurred with a lowered snow level--about 4,000 -5,000 feet.

The time distribution of precipitation at representative stations is shown on the plates of the hydrographs for river gaging stations.

The aerial distribution of precipitation is shown in the isohyetal maps on Plates 5 and 10.

Heavy rains cause problems other than flooding. This swimming pool was floated out of the ground by the rain-soaked soil. Photograph courtesy of The Sacramento Bee.

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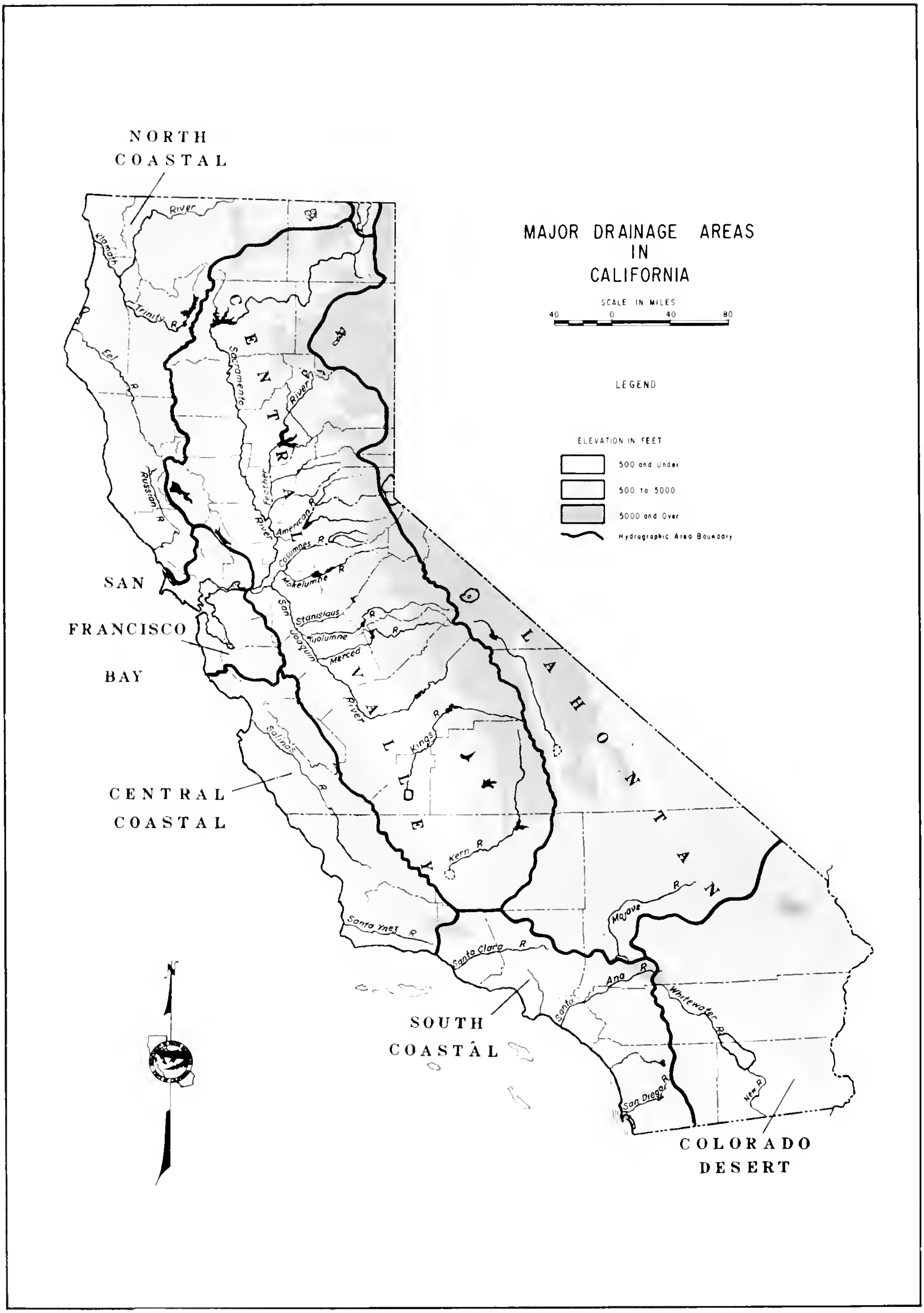
[1]Robert D. Elliott, "Forecasting the Weather--The Weather Types of North America", Weatherwise, bimonthly issues February-December 1949.

[2]Formally called The United States Weather Bureau.

[3]U.S. Weather Bureau-Corps of Engineers Hydrometeorological Report No. 37, "Meteorology of Hydrologically Critical Storms in California", December 1962.

[4]Corps of Engineers, Sacramento District, Technical Bulletin No. 4, "Ten-Year Storm Precipitation in California and Oregon Coastal Basins".



MAJOR DRAINAGE AREAS
IN
CALIFORNIA
SCALE IN MILES
40 0 40 80
LEGEND
ELEVATION IN FEET
500 and Under
500 to 5000
5000 and Over
Hydrographic Area Boundary
NORTH COASTAL
SAN FRANCISCO BAY
CENTRAL COASTAL
SOUTH COASTAL
COLORADO DESERT
CENTRAL VALLEY
LAHONTAN
Klamath River
Trinity R
Eel R
Russian R
Sacramento River
Pit River
Feather River
American R
Cosumnes R
Mokelumne R
Stanislaus R
Tuolumne R
Merced R
San Joaquin River
Kings R
Kern R
Salinas R
Santa Ynez R
Santa Clara R
Santa Ana R
Mojave R
Whitewater R
San Diego R
New R

RAINFALL-RUNOFF

During the 1969-70 water year, only one major high water event occurred. This took place in January 1970 on the Sacramento River with the highest flows of record occurring at several points, and Shasta Dam receiving the highest inflow of record.

The water year started out as usual with no spectacular events occurring. At the beginning of December, precipitation totals were about normal in the North Coast area, around half of normal in the Central Valley, and near normal in the southern portion of the State. A series of storms moved into the northern portion of California the second week of December and lasted pretty much through the month. These storms caused the North State's rivers to rise to moderately high stages, but no problems were experienced. The rains served to moisten the dry ground with the effect that later storms would produce more runoff per inch of rain. After the storms had passed, the precipitation totals in the North and Central State were near normal, while the southern portion was far below normal because little or no rain fell in that area.

A new storm series entered the State during the second week of January and turned out to be the big one. Wet weather covered most of the State, but the northern half was hit the hardest. Precipitation totals for the month were high, with the North Coast area rainfall varying from 200 percent of the January normal in the north to 300 percent of normal in the Russian River area. In the Sacramento Valley, the monthly precipitation ranged between 200 and 350 percent of the January normal for the various stations. The rainfall in the Feather and Yuba River Basin was equally as intense, with the different precipitation stations reporting monthly totals ranging from 200 to 300 percent of normal. The heavy rain quickly saturated the soil in all the basins, and before long nearly every drop of rain that fell became runoff.

The North Coast streams responded to the rainfall with rapid rises accompanying each burst of rain, with some streams reaching or exceeding flood stages. In addition to the high water the rain saturated the ground to the point that several mudslides occurred blocking highways and causing other damage. In the Central Valley, the continuous rainfall, which was intense at times, affected river stages. As mentioned before, the Sacramento River experienced some of the highest stages and flows of record.

Total runoff resulting from this storm series was quite high. Runoff in the North Coast area ranged from about 400 percent of the January normal for most streams to almost 600 percent of normal for the Trinity River. In the Sacramento Valley the runoff amounted to 500 percent of the normal for January on the Sacramento River, and over 600 percent of the normal on the Feather and Yuba Rivers.

The reservoirs of the State did a splendid job of retaining the massive runoff by storing the flood flows until after the passage of the storm. After the flood peaks had passed, releases were made in a controlled manner. Even though property damage was high because of flooding, very few deaths or injuries were attributed to the storm. Without the reservoirs, however, property damage could have been much higher.

The flood damage in the Sacramento River Basin from the January storms was ranked as the third most destructive in recorded flood history for this area with damages estimated at $28,500,000 and approximately 550,000

Table 1: Precipitation Amounts at Selected Stations for Various Periods of the December 1969 Storm Series

Station	County	Elev.	Dec. 11-12	Dec. 19-21	Dec. 23-24	Storm Total Dec. 8-27
Gasquet	Del Norte	384	4.02	5.85	2.70	21.61
Hoopa	Humboldt	345	3.19	4.05	0.80	15.04
Laytonville	Mendocino	1640	5.89	5.63	1.46	19.14
Healdsburg	Sonoma	102	5.71	7.76	2.05	18.58
Redding	Shasta	580	3.29	6.80	1.49	15.09
De Sabla	Butte	2713	5.87	8.39	4.14	22.21
Sacramento WB AP	Sacramento	17	0.16	2.72	0.81	4.41
Blue Canyon	Placer	5280	1.87	8.00	5.89	19.38
Calaveras Big Trees	Calaveras	4696	0.33	3.84	1.93	11.75
Wawona R.S.	Mariposa	3965	0	2.20	0.26	4.25
Milo 5NE	Tulare	3400	0	1.63	0	3.02
Huasna	San Luis Obispo	715	0	0.36	0	0.73
Cachuma Dam	Santa Barbara	781	0	0.09	0	0.32
Camp Hi Hill Opids	Los Angeles	4250	0	Trace	0	0.05

Table 2: Precipitation Amounts at Selected Stations for Various Periods of the January 1970 Storm Series

Station	County	Elev.	Jan. 13-14	Jan. 16	Jan. 21-23	Storm Total Jan. 7-31
Gasquet	Del Norte	384	2.95	1.55	9.17	35.35
Hoopa	Humboldt	345	2.41	1.61	6.15	23.40
Laytonville	Mendocino	1640	2.67	2.83	9.57	31.72
Venado	Sonoma	1260	5.40	4.50	12.20	43.90
Shasta Dam	Shasta	1076	7.10	1.40	11.70	35.90
De Sabla	Butte	2713	7.43	2.56	7.82	31.56
Sacramento WB AP	Sacramento	17	2.30	0.73	1.04	7.88
Blue Canyon	Placer	5280	5.93	4.34	7.99	33.86
Calaveras Big Trees	Calaveras	4696	2.76	2.92	4.98	23.17
Wawona R.S.	Mariposa	3965	1.67	3.38	1.43	14.87
Milo 5NE	Tulare	3400	1.50	5.03	0	11.23
Huasna	San Luis Obispo	715	0.30	1.99	0	4.36
Cachuma Dam	Santa Barbara	781	0.05	0.51	0	2.33
San Gabriel Dam	Los Angeles	1481	0.10	0.56	0	1.93

acres inundated. Only the floods of December 1955 and December 1964-January 1965 caused more damage. The U. S. Army Corps of Engineers has estimated that the reservoirs which have flood control as a purpose of their operation prevented nearly $153,000,000 damage. There are no exact figures on flood-related deaths; however, deaths did occur from heart seizures and from boating and automobile accidents during the January storms.

For the rest of the water year, precipitation was generally below normal, with the net effect that the precipitation totals for the water year were about normal for most of the State. Because of this, the total unimpaired runoff for the water year was slightly above normal on most of the streams. Only the Russian and Napa River Basins had unimpaired runoff near 200 percent of normal for the water year.

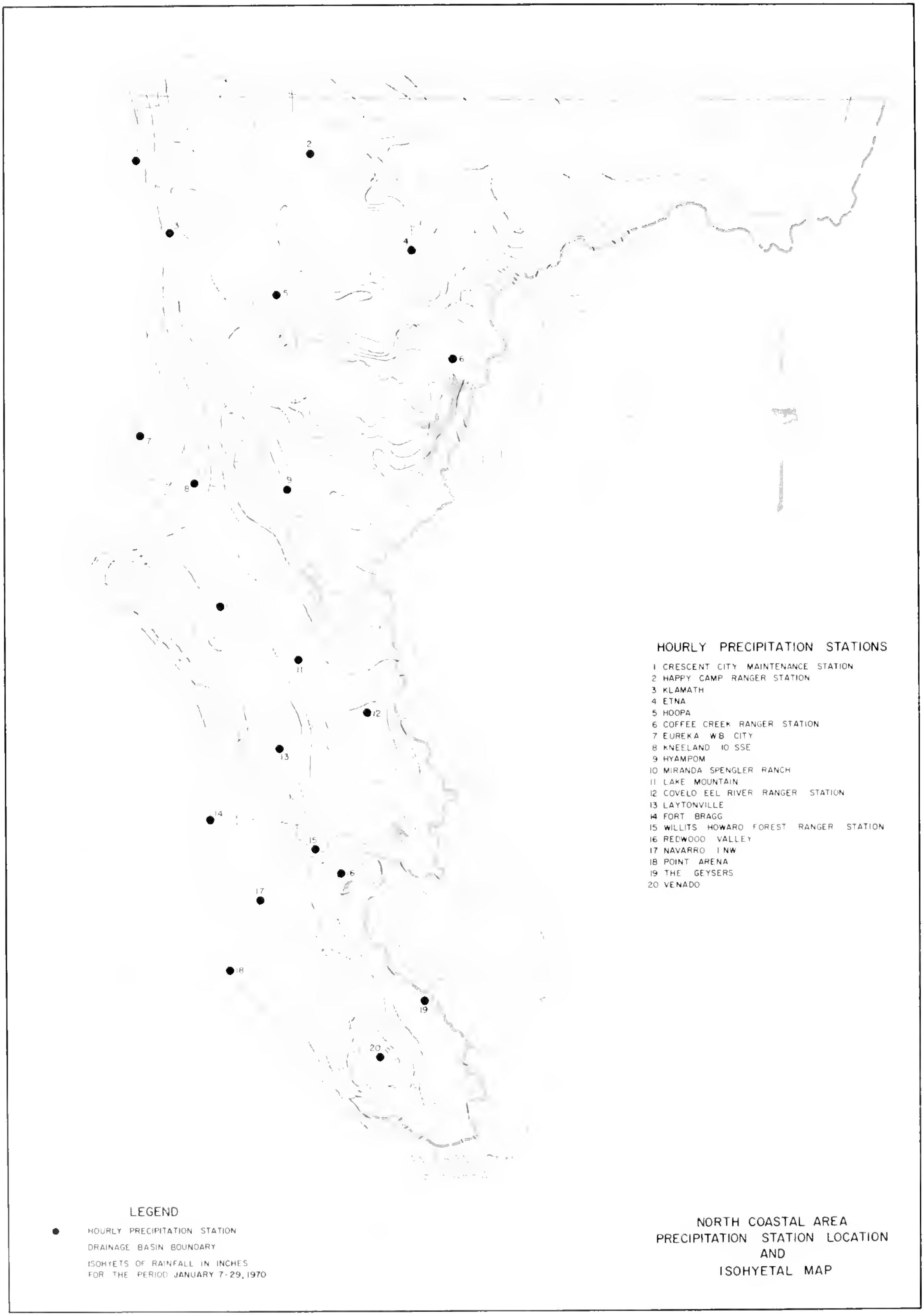
At the end of the water year 1969-70, storage in 121 of California's major reservoirs was about 20,162,000 acre-feet, which is approximately 111 percent of the average ten-year carryover storage. This storage was about 2,100,000 acre-feet less than the previous year's total storage in the same reservoirs.

Ground water was relied on more heavily during the year as a supplementary water supply. In the San Joaquin Valley, ground water levels generally declined due to the increased pumping. However, in Southern California, ground water levels remained near the previous year's levels with a slight decline noted in some of the areas.

Because of the high water caused by the storms, the Department's Flood Operations Center was activated on a 24-hour basis from December 19 to 28 to handle the storms of that period. On January 13, the Flood Operations Center was activated once again to work the January storms, and activation continued until February 2 when the danger had passed. Governor Ronald Reagan declared a State of Emergency beginning on January 17, which continued until February 28. As a result of the flood damage, the Governor proclaimed 17 counties as disaster areas under the State laws, and the President declared these same counties disaster areas under the Federal laws.

Data used in this Bulletin were supplied by a number of agencies, both public and private, and are considered to be accurate and reliable. However, hydrologic data may be revised on the basis of subsequent studies and information. Therefore, the data in this Bulletin are considered preliminary until published by the responsible agency.

PLATE 5



HOURLY PRECIPITATION STATIONS
1 CRESCENT CITY MAINTENANCE STATION
2 HAPPY CAMP RANGER STATION
3 KLAMATH
4 ETNA
5 HOOPA
6 COFFEE CREEK RANGER STATION
7 EUREKA WB CITY
8 KNEELAND 10 SSE
9 HYAMPOM
10 MIRANDA SPENGLER RANCH
11 LAKE MOUNTAIN
12 COVELO EEL RIVER RANGER STATION
13 LAYTONVILLE
14 FORT BRAGG
15 WILLITS HOWARD FOREST RANGER STATION
16 REDWOOD VALLEY
17 NAVARRO 1 NW
18 POINT ARENA
19 THE GEYSERS
20 VENADO
LEGEND
HOURLY PRECIPITATION STATION
DRAINAGE BASIN BOUNDARY
ISOHYETS OF RAINFALL IN INCHES
FOR THE PERIOD JANUARY 7-29, 1970
NORTH COASTAL AREA
PRECIPITATION STATION LOCATION
AND
ISOHYETAL MAP

North Coast Hydrographic Area

The North Coast Hydrographic Area extends 270 miles along the coast from the California-Oregon border in the north through the Russian River Basin in the Santa Rosa area. The area ranges in width from 180 miles at the northern end to 30 miles in the southern portion.

Storms in the North Coast area are more frequent, and monthly precipitation is higher in parts of this area than in any of the other six major hydrographic areas of the State. Runoff is derived mainly from rainfall with only a relatively small portion contributed by snowmelt.

At the beginning of December the rainfall totals for the area ranged from normal to slightly below normal. On December 7, the series of storms that moved into California began dumping large amounts of rain in the North Coast area. The storms continued through the 27th; and although the rainfall was heavy at times, precipitation totals at the end of December were just slightly above normal. The rains caused some rises on the North Coast rivers, but all of the rises were below the warning stages and caused very few problems.

After a dry New Years, a new series of storms began pelting the State on January 8. This storm series continued until the end of the month and dropped a large amount of rain on the already wet North Coast area. The high precipitation in the area caused some of the rivers to rise above flood stages, with flooding reported on the Smith, Klamath, Eel, and Russian Rivers. When the rain stopped at the end of the month, precipitation totals had climbed to 130 percent of normal in the north and 160 percent of normal in the southern portion of the North Coast area.

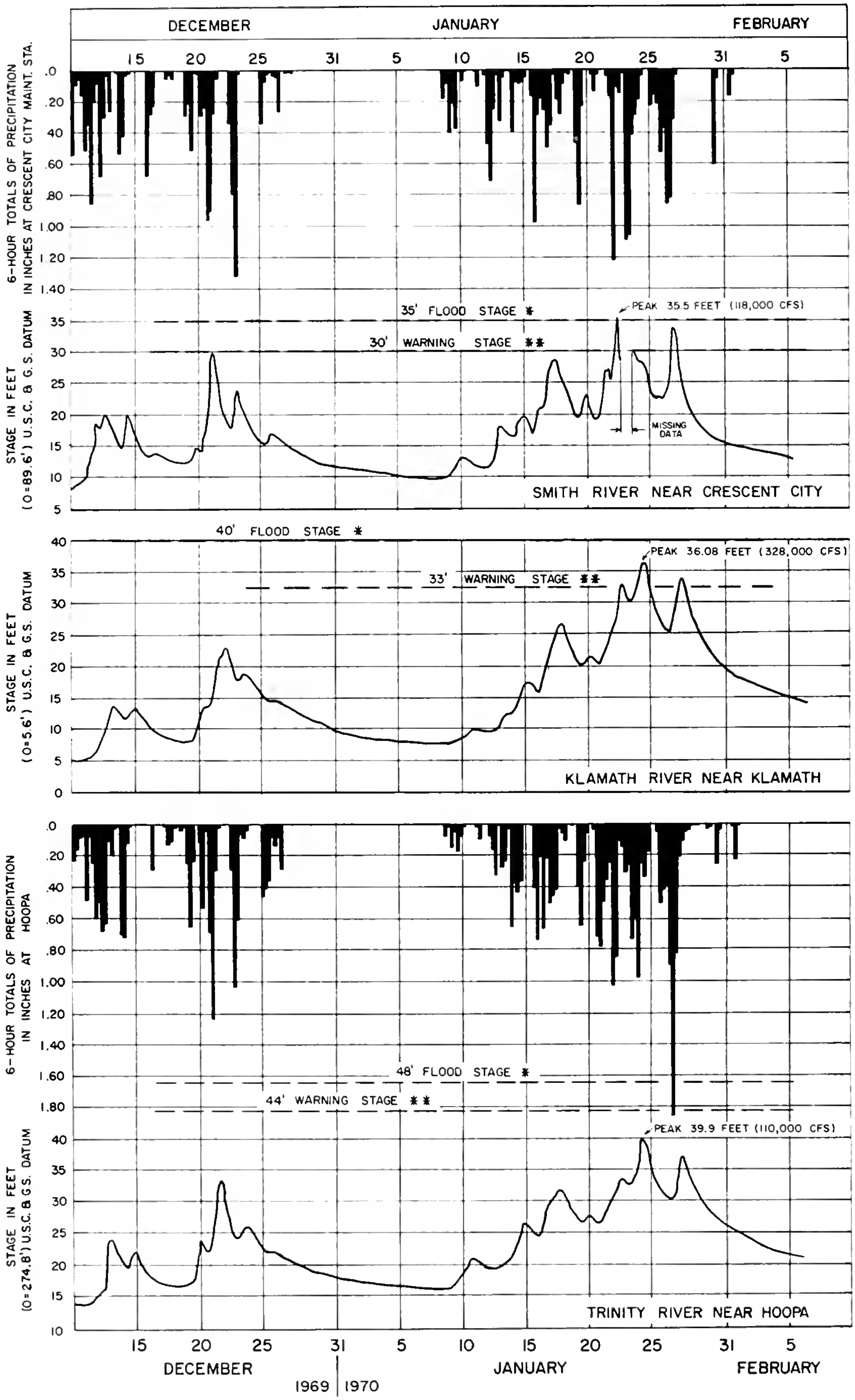
Smith River Basin

The three forks of the Smith River drain a basin of 770 square miles, of which 90 square miles lie in Oregon. Almost the entire basin consists of mountains and foothills, most of which lie below 3,000 feet. However, along the eastern boundary of the basin, elevations exceeding 5,000 feet are common; Bear Mountain at 6,424 feet is the highest point.

Beginning on December 7, the basin was subjected to a series of rain storms that lasted until almost the end of the month; the storms caused minor peaking on the Smith River during the middle of the month. On December 20, the downpour increased considerably, and at Crescent City the river rose to the warning stage of 30 feet. However, this peak receded and no further trouble occurred until January.

On January 8, the onslaught of rain began again and continued until the end of the month, with some of the storms dropping large amounts on the basin. This brought the river levels up once again, and flood stages were reached for the first time of the season on January 22. The flood waters resulted in minor damage mainly to low lying farmland and trailer parks. One death resulted from the flooding, when a car was struck by a tree loosened by the high water in the Smith River. A second death was recorded when a man was washed from a car that skidded into the river.

Several mudslides resulted from the heavy precipitation soaking the ground. Highway 199 to Oregon was closed for a time above Patrick Creek, as were other roads in the area. A



HYDROGRAPHS OF SMITH, KLAMATH AND TRINITY RIVERS

* FLOOD STAGE - Nonleveed Streams - Stage at which significant overbanking occurs.
- Leveed Streams - Stage at which design capacity of levee is reached.

** WARNING STAGE - Nonleveed Streams - Stage at which initial action must be taken.
- Leveed Streams - Stage at which patrol of project levees becomes mandatory.

massive slide blocked the Big Flat Road in the mountains east of Crescent City. This slide moved across the road and blocked the south fork of the Smith River for awhile. However, the river broke through this slide, thus preventing a massive water buildup that could have eventually caused flooding downstream. Because of the large amount of slide damage, Del Norte County was declared a disaster area.

Plate 6 shows the stages for the Smith River near Crescent City and the precipitation amounts at that city.

Klamath River Basin

The Klamath River and its major tributaries, the Salmon, Shasta, Scott, and Trinity Rivers, drain basins with a combined area of 15,715 square miles. About a third of this area lies in Oregon. The terrain in this basin is comprised of rugged mountains with elevations ranging from sea level to over 8,000 feet.

Rain began falling on this basin on December 7 and continued through most of the month. This storming caused some minor stages on the rivers but these were well-below warning stages. No flooding was reported, and the rain served mainly to wet the basin.

Storms began moving into this basin again on January 8, and the river responded with some minor peaks in the lower regions. As the storms continued, the river peaks increased. Following heavy rains, a wall of water some 1,000 feet wide passed through the community of Fort Jones on the Scott River about January 27 and left 10 to 12 inches of mud and silt on the floors of the homes and businesses. Watermarks four feet above ground were left on some of the houses as an indication of the intensity of the flooding. Because of the large amount of rain, some minor flooding occurred in the low lying areas of the basin and closed some local roads, but all stages were below designated flood stages in these areas. A major problem resulting from the high water was bank erosion in the lower portion of the basin, with the river eroding away large chunks of land.

The rain-soaked soil resulted in several mudslides in this basin. Several roads in the area were blocked by slides, with Highway 96 closed at three locations for a time.

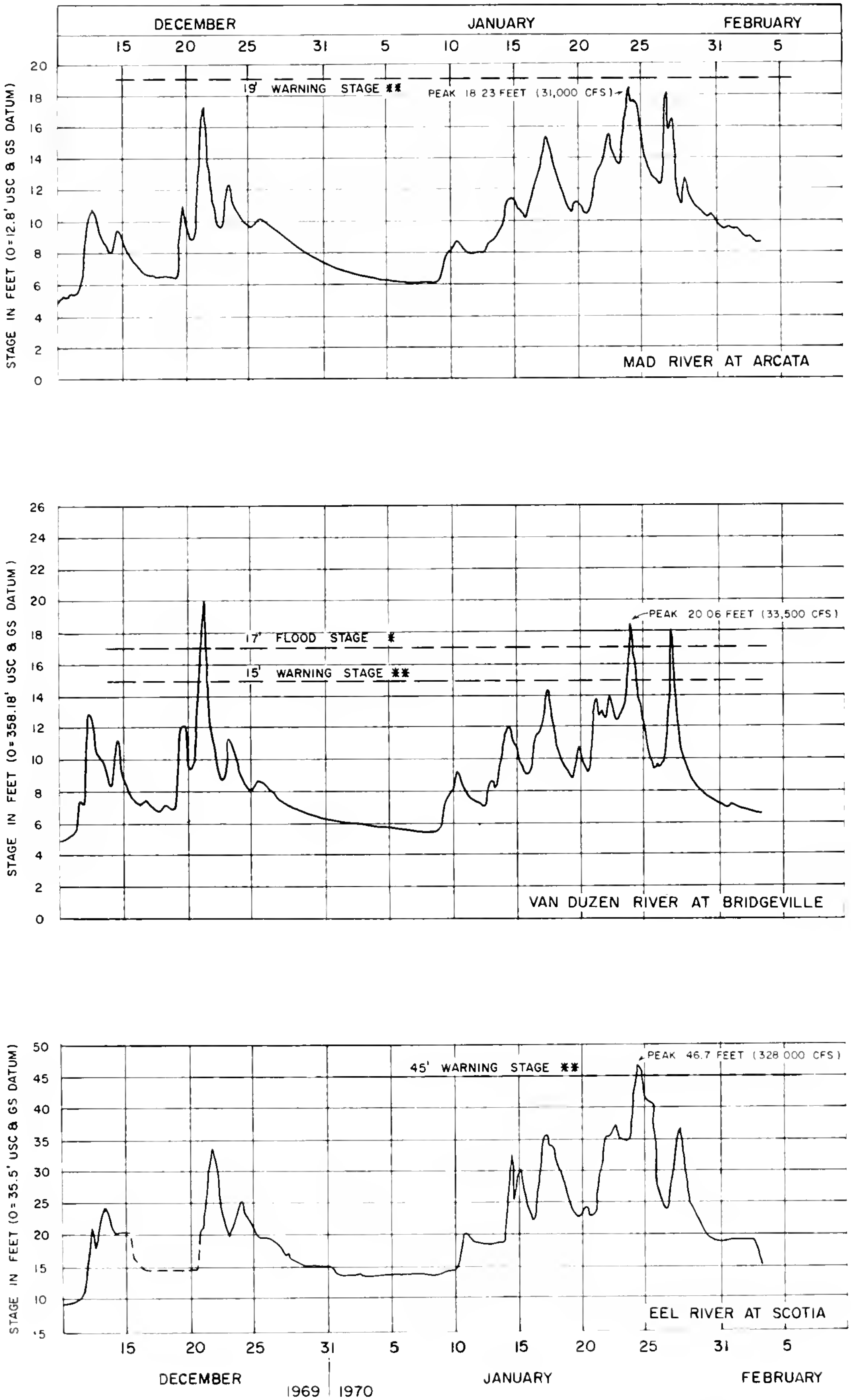
High water stages for both the Trinity River near Hoopa and the Klamath River near Klamath are shown on Plate 6, along with the precipitation record at Hoopa.

Eel River Basin

The Eel River and its principal tributary, the Van Duzen, drain an inland basin of 3,700 square miles. Most of the basin is classified as rough, heavily wooded foothills and mountains, with elevations ranging from sea level to more than 7,000 feet.

Rain began falling on the Eel River Basin on December 8 and continued throughout most of the month. River stages on the Eel were relatively low and caused little concern, although some low lying roads were inundated, and cattle were moved to higher ground. However, on December 21, following three days of heavy rainfall, the Van Duzen peaked at about three feet above flood stage. Flooding occurred at several locations along Highway 36, and the residents of Starvation Flat were evacuated when the levee surrounding the area washed away.

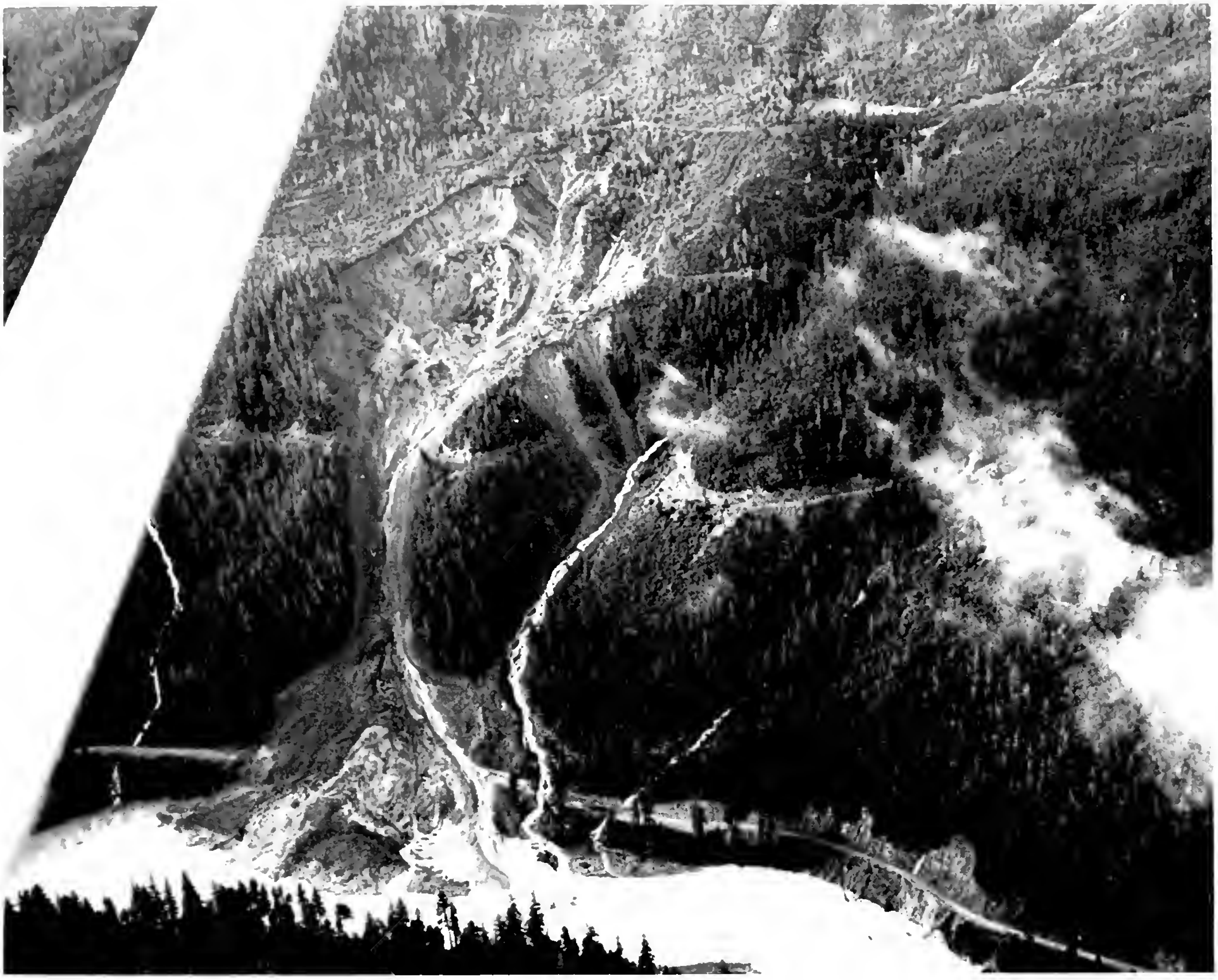
January's storms brought new rises in the rivers. These remained well below warning stage until late in the month, when heavy precipitation caused very rapid rises. The Van Duzen left its banks at Bridgeville on the 23rd and again on the 27th, and the Eel River rose to five feet above flood stage at



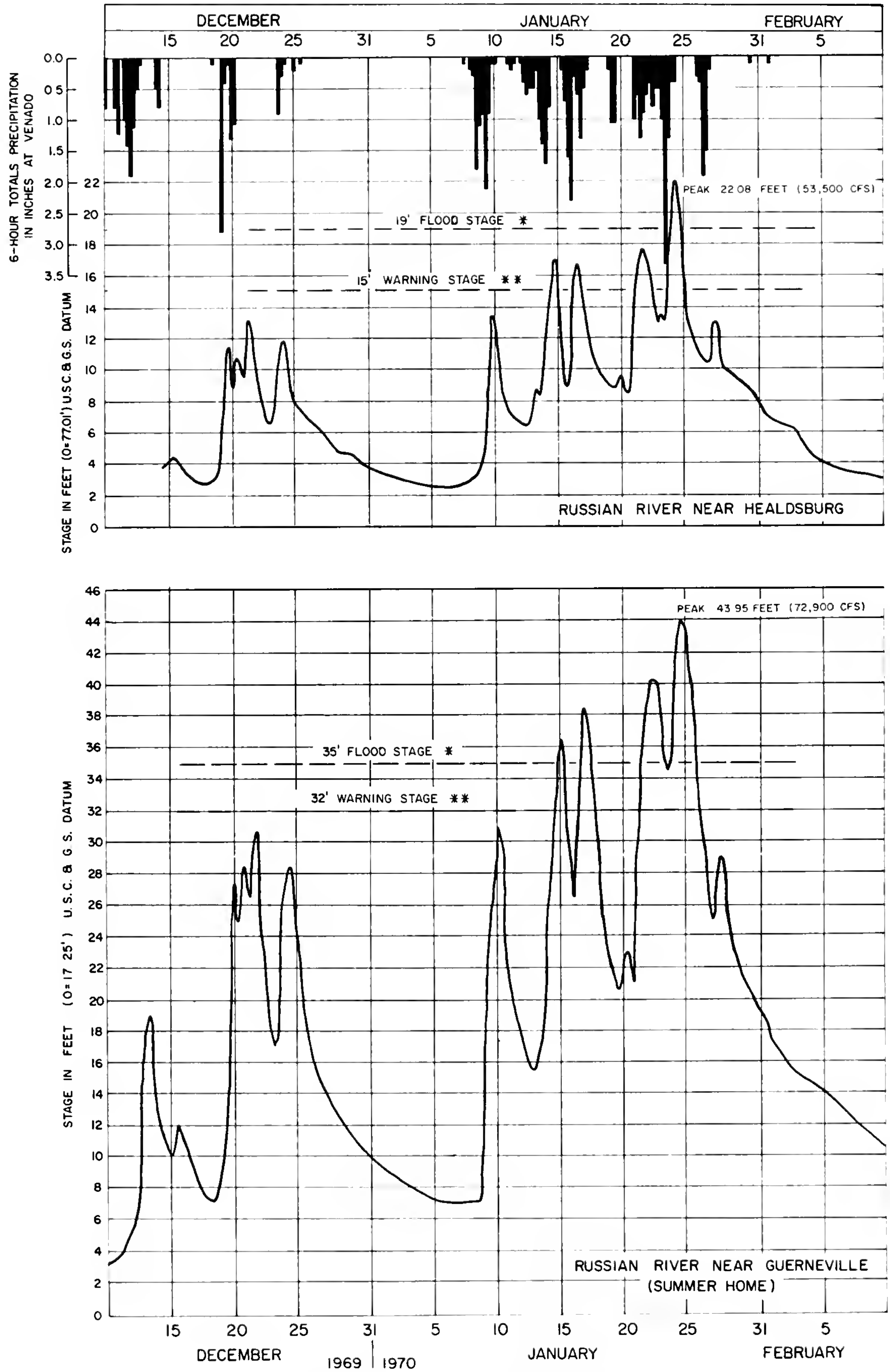
HYDROGRAPHS OF MAD, VAN DUZEN AND EEL RIVERS

FLOOD STAGE - Nonleveed Stream. - Stage at which significant overbanking occurs.
- Leveed Stream. - Stage at which design capacity of levee is reached.

WARNING STAGE - Nonleveed Streams - Stage at which initial action must be taken.
- Leveed Streams - Stage at which patrol of project levees becomes mandatory.



A massive mudslide on the Smith River threatened to block the river for a time. Photograph taken by Wally Griffin from a Benbow Aero Inc. plane flown by Gail Ebbutt.



HYDROGRAPHS OF RUSSIAN RIVER

* FLOOD STAGE	- Nonleveed Streams	- Stage at which significant overbanking occurs.
	- Leveed Streams	- Stage at which design capacity of levee is reached.
** WARNING STAGE	- Nonleveed Streams	- Stage at which initial action must be taken.
	- Leveed Streams	- Stage at which patrol of project levees becomes mandatory.

Fernbridge. Some towns in the basin, such as Pepperwood and Port Kenyon, were flooded, and several local roads were under water. Bank erosion along the Eel River near Shively threatened to cut the railroad for a time, but the threat diminished when the river stages receded.

Flooding and mudslides resulting from the rain-soaked soil closed several roads in the basin, causing long traffic delays. The railroad, another major transportation link in this area, was also closed for awhile due to mudslides.

Hydrographs showing flood stages for both the Van Duzen River at Bridgeville and the Eel River at Scotia are shown on Plate 7.

Russian River Basin

The Russian River is 112 miles long and drains a basin of 1,500 square miles, 85 percent of which is classified as rugged mountainous terrain. Elevations in this basin are relatively low, with the highest point being near 4,700 feet.

During December two series of storms moved through the basin, causing some minor river rises. The basin was initially wetted by light rains that began December 3 and continued through the 14th. On December 18 a new storm hit the basin and caused increased river stages, but the peaks were well below the danger levels for the river.

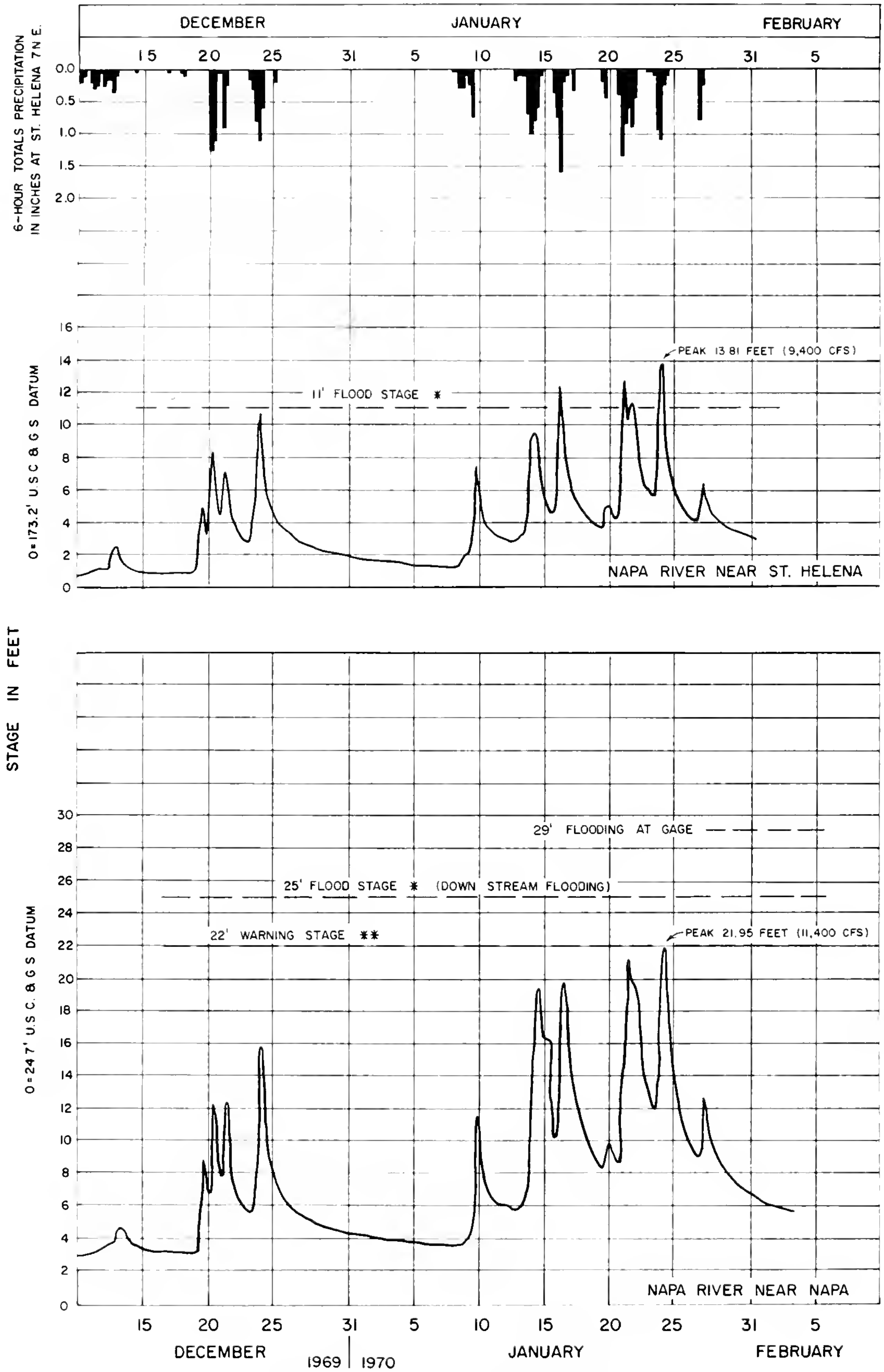
A new series of storms moved into the area on January 7 and continued until the end of the month. These storms deposited a large amount of water on the already soggy basin. Nearly 44 inches of rain were recorded for the month at the Venado rain gage. River stages peaked several times below the flood stage at Healdsburg until January 23, when the river left its banks for a day with the peak about three feet above flood stage of 19 feet.

Further downstream the river went over its banks twice for short times near Guerneville between the 14th and 17th. On January 22 the river went above flood stage of 35 feet at Summerhome, and remained there for the next four days. The river peaked about nine feet above flood stage on the 25th, then receded to safe levels the next day.

Flood damage was reported all along the river with a majority of this damage occurring in the resort area from Healdsburg to the coast. One death near Guerneville was attributed to the flooding.

Besides the heavy flooding, the heavy rain saturated the soil sufficiently to cause several mudslides in the basin. One major mudslide blocked Highway 101 above Cloverdale, closing this road for several hours. Other mudslides above Ukiah also closed the highway for short times, causing detours and delays to the travelers along the route.

Hydrographs of the river stages on the Russian River at Healdsburg and Guerneville, are shown on Plate 8, along with the precipitation amounts at Venado.



HYDROGRAPHS OF NAPA RIVER

[illegible] - [illegible] Stream - Stage at which significant overbanking occurs.
- Leveed Streams - Stage at which design capacity of levee is reached.
WARNING STAGE - Nonleveed Streams - Stage at which initial action must be taken.
- Leveed Streams - Stage at which patrol of project levees becomes mandatory.

San Francisco Bay Hydrographic Area

The San Francisco Bay Hydrographic Area encompasses the area surrounding Suisun, San Pablo, and San Francisco Bays. The area extends from above Petaluma on the north to near Gilroy on the south and from approximately Pittsburg on the east to the coastline on the west.

Most of the streams of this area drain small areas and flow into one of the bays. The one major river in this area is the Napa River, which drains the fertile Napa Valley. Runoff in the San Francisco Bay area is mainly from rainfall with very little snow falling in the area.

Rainfall up to the end of December was only slightly above normal for the area. The rains which plagued California in December had little effect except to wet the area. On January 8 the rain began again and continued through the month, becoming very heavy at times. This downpour caused considerable local flooding with streets flooded in Mill Valley and other parts of Marin County and in the East Bay Counties. Some major landslides occurred in the Oakland area from the rain-saturated ground, with one slide threatening an aviation jet-fuel pipeline leading to the Oakland International Airport. Other slides destroyed homes in the Oakland area and in Marin County. By the end of January, the rainfall total was almost 150 percent of the normal, and the effects of the rain had left Alameda and Marin Counties in such disrepair that they were declared disaster areas.

Napa River

The Napa River drains a basin of 230 square miles upstream from the City of Napa and discharges into the San Pablo Bay. An interesting feature of this basin is that the Napa River has year-round flow at the St. Helena gaging station but is dry at the Napa gaging station for one or more months during the summer. This is attributed to irrigation pumping from the river and seepage to ground water. Floods on the Napa River are of the flash flood variety--rapid rises and short duration.

The Napa River Basin was initially wetted by rain that began on December 8 and lasted for five days. A second rainy period began December 18 and continued until Christmas. During this second storm series, heavy downfall persisted about twelve hours each day with each burst producing a sharp rise on the river. On December 24 the river reached close to flood stage at St. Helena after a downpour of almost 3.5 inches in the upper basin.

After a dry New Years, the rain began again on January 8 and continued until the end of the month. The rain was heavy at times and produced sharp rises on the river. On January 16 the river left the banks at St. Helena for a few hours and then quickly receded.

Starting January 20, the rain became continuous and in sufficient amounts to cause flood stages on the river at St. Helena. The river overflowed at this point on the 21st for about a day and again on January 23, when the river stage went about three feet above the flood stage of 11 feet for a few hours. These flood crests were recorded downstream at Napa but were below the warning stage at that point.

Hydrographs of the river stages of the Napa River at St. Helena and Napa, along with the precipitation record at St. Helena, are shown on Plate 9.

Flooding of roads caused inconveniences to motorists.

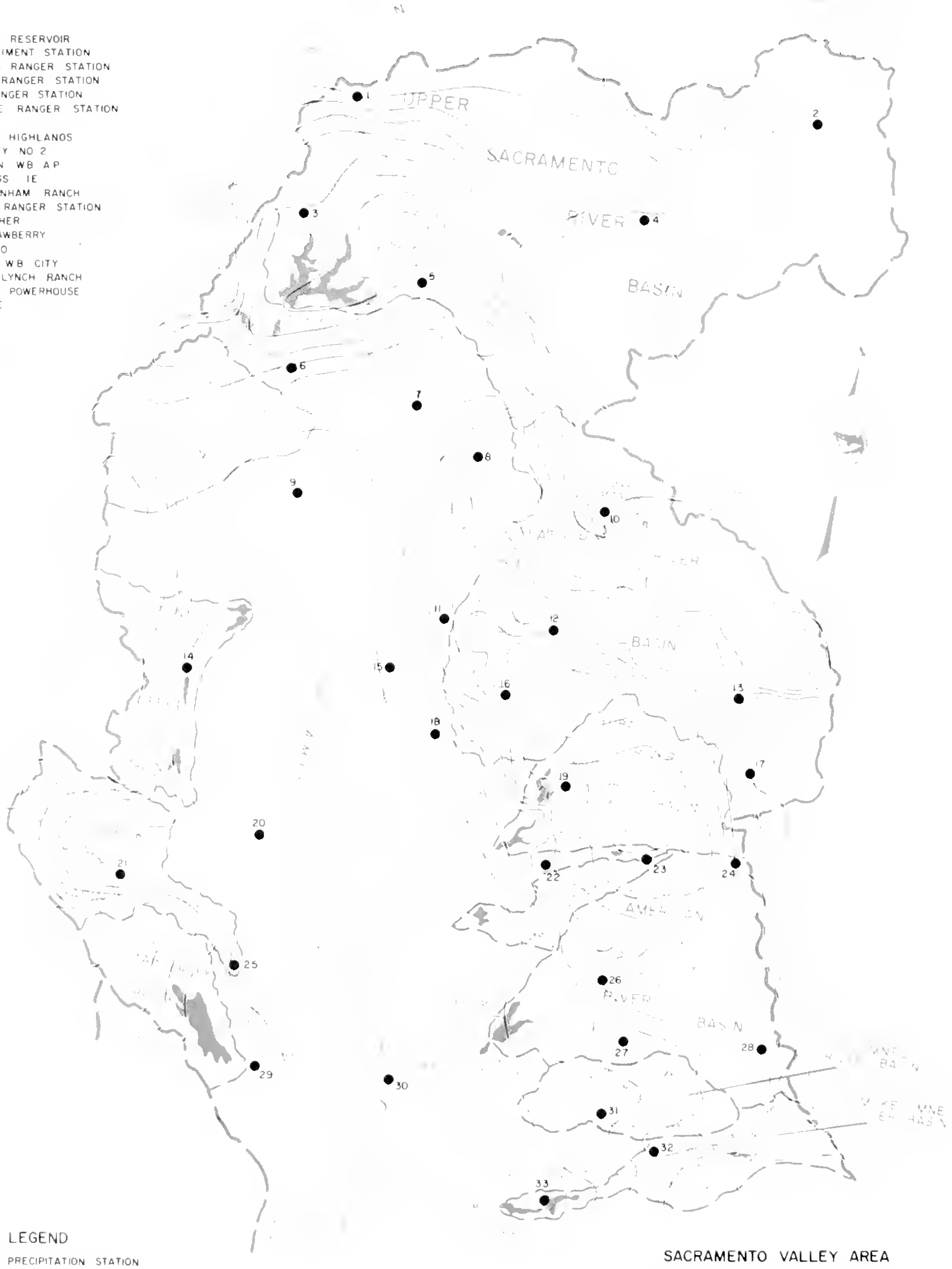
A levee break caused the town of Nubieber to be inundated.

Flooding in Chester, California caused inconvenience to the local residents and destroyed property in the area.

Photographs courtesy of The Sacramento Bee.

HOURLY PRECIPITATION STATIONS

1 MOUNT SHASTA WB CITY
2 ALTURAS RANGER STATION
3 VOLLMERS
4 BEIBER
5 ROUND MOUNTAIN 1NNE
6 REDDING 5SSE
7 VOLTA POWERHOUSE
8 MINERAL
9 RED BLUFF WB AP
10 HAMILTON BRANCH POWERHOUSE
11 DE SABLA
12 BUCKS LAKE
13 PORTOLA
14 STONY GORGE RESERVOIR
15 CHICO EXPERIMENT STATION
16 BRUSH CREEK RANGER STATION
17 SIERRAVILLE RANGER STATION
18 OROVILLE RANGER STATION
19 CAMPTONVILLE RANGER STATION
20 WILLIAMS
21 CLEAR LAKE HIGHLANDS
22 GRASS VALLEY NO 2
23 BLUE CANYON WB AP
24 SODA SPRINGS 1E
25 BROOKS FARNHAM RANCH
26 GEORGETOWN RANGER STATION
27 MOUNT DANAHER
28 KYBURZ STRAWBERRY
29 LAKE SOLANO
30 SACRAMENTO WB CITY
31 FIDDLETOWN LYNCH RANCH
32 TIGER CREEK POWERHOUSE
33 CAMP PARDEE



LEGEND

- ● HOURLY PRECIPITATION STATION
- — ORAINAGE BASIN BOUNDARY
- ISOHYETS OF RAINFALL IN INCHES FOR THE PERIOD JANUARY 7-29, 1970

SACRAMENTO VALLEY AREA
PRECIPITATION STATION LOCATION
AND
ISOHYETAL MAP

Central Valley Hydrographic Area

The Central Valley Hydrographic Area comprises all of the stream basins that drain into the Sacramento and San Joaquin Valleys upstream of the point where the Sacramento River discharges into Suisun Bay at Collinsville. This area averages 120 miles in width and 500 miles in length.

In the Sacramento Valley the principal streams are the Sacramento River and its tributaries: the McCloud, Pit, Feather, Yuba, Bear, and American Rivers, which flow from the Sierra Nevada Range on the east, and Cottonwood, Stony, Cache, and Putah Creeks, which drain from the coastal ranges on the west. Main streams of the San Joaquin Valley are the San Joaquin River and its principal tributaries: the Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, and Merced Rivers, which drain from the Sierra Nevada Range on the east. The Kings, Kaweah, Tule, and Kern Rivers flow from the Sierra Nevada into Tulare Lake with some of the flood flows of the Kings River being tributary to the San Joaquin River by way of Fresno Slough. In times past, during periods of flood, Tulare Lake has overflowed into the San Joaquin River.

The Sacramento and San Joaquin Rivers converge in the intricate system of channels of the Sacramento-San Joaquin Delta before flowing into Suisun Bay.

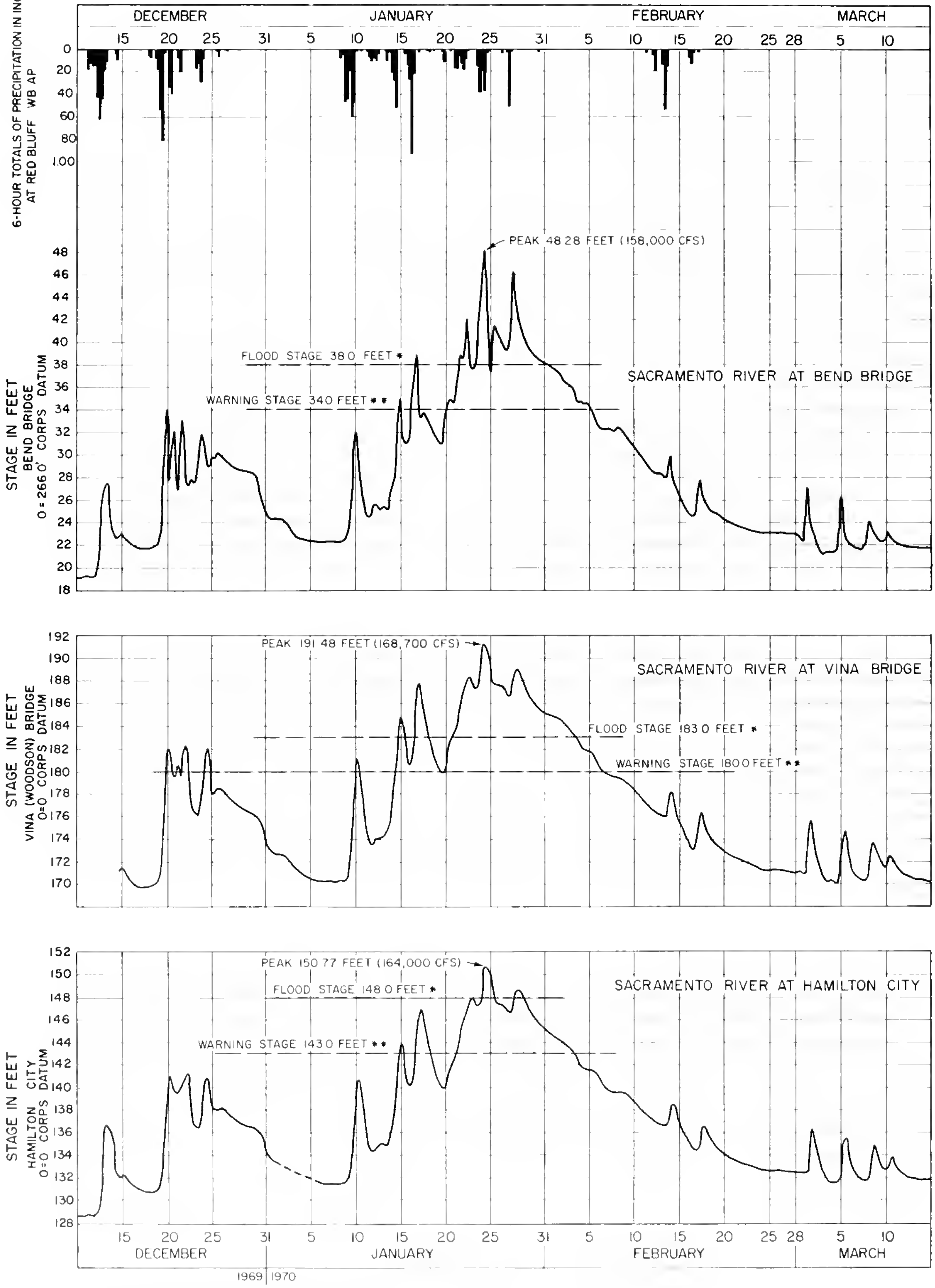
At the beginning of December, the precipitation totals in the Central Valley were about half of the normals. These totals began to rise when a storm series entered the Sacramento Valley on December 8. This series of storms continued through the 27th and raised the precipitation totals to slightly above the normal amounts by the end of the month. These storms caused some rises and minor flooding on the Sacramento River, its tributaries, and the bypasses.

On January 8, a new series of storms swept into the Sacramento Valley and dropped large amounts of rain on the area. The storms lasted until the end of the month and dumped nearly twice the normal January rainfall. The massive rainfall brought the precipitation totals to around 140 percent of normal at the end of January. This rainfall caused flooding along the Sacramento River and its tributaries with record flows being established at several locations.

Sacramento River Basin

During December, the warm rains that plagued all of Northern California caused several rises on the Sacramento River and its tributaries. Some of the low sloughs and roads were flooded, and the Sacramento River flowed over the Colusa and Tisdale Weirs, flooding the Sutter Bypass system and inconveniencing agricultural interests.

After Christmas the moisture stopped for awhile and the rivers receded, but the rain began again the second week in January, and the rivers responded with several sharp rises. The continuous storms caused the northern reaches of the Sacramento River to overflow for the first time on the 16th; on the 21st, with the advent of very heavy rain, the river again left its banks. Nearly 14 inches of rainfall was recorded at Shasta Dam between the 19th and the 23rd, and because the basins were saturated, almost all the precipitation became runoff. Late on January 23 the inflow into Shasta Lake peaked at about 210,000 cfs, the highest inflow of record. Releases from Keswick Dam had been reduced to 15,000 cfs at the time of the peak inflow.



HYDROGRAPHS OF UPPER SACRAMENTO RIVER

High stages on the Sacramento River inundated parts of the towns of Anderson (above) and Redding (below). Photographs courtesy of The Record Searchlight, Redding.

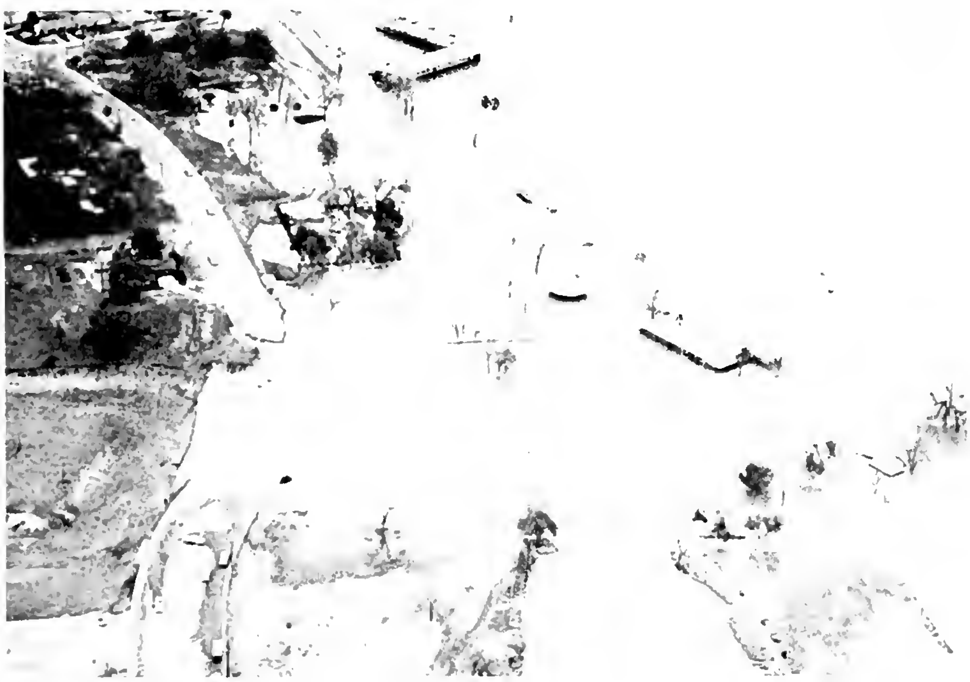
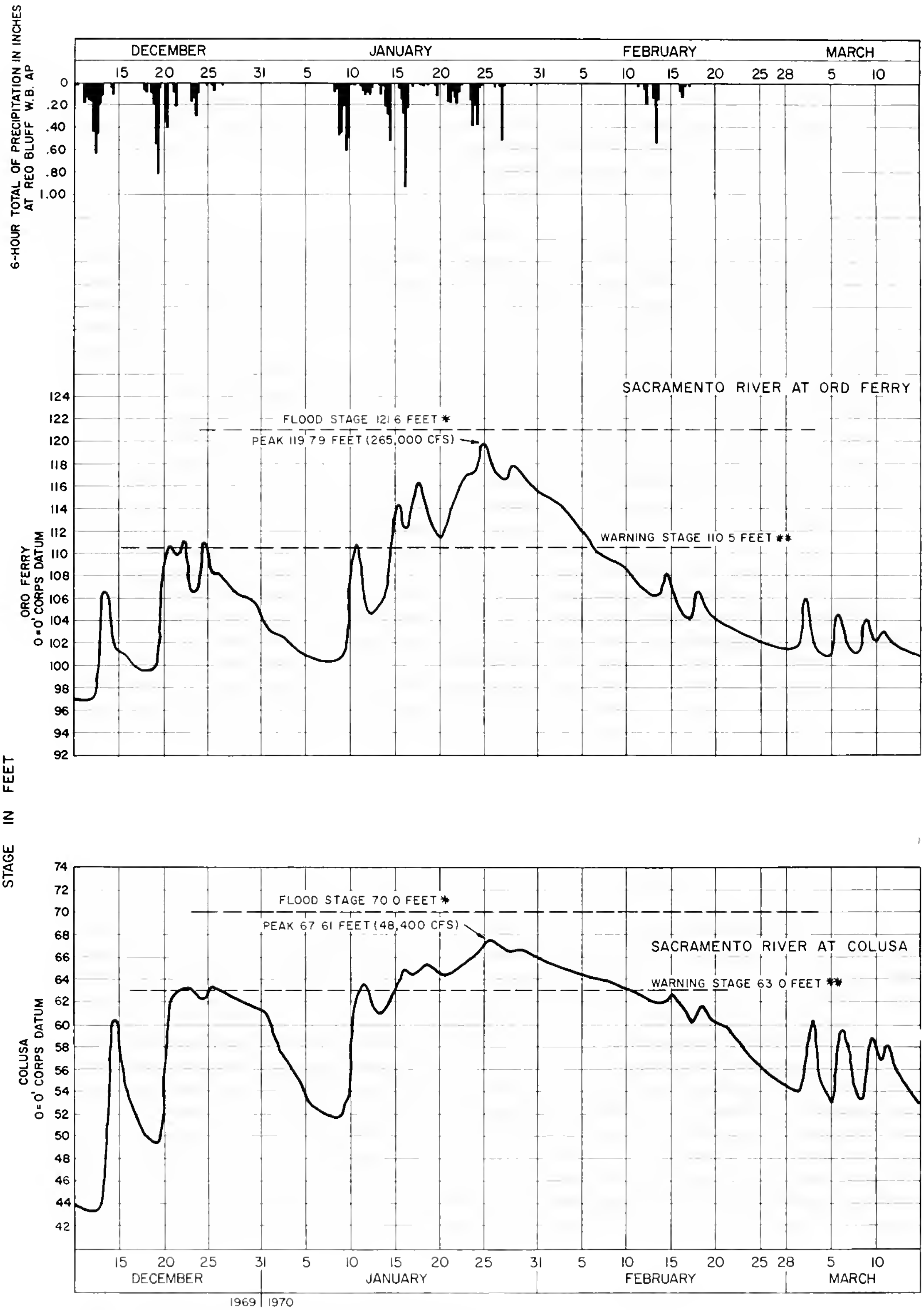


PLATE 12



HYDROGRAPHS OF MIDDLE SACRAMENTO RIVER

Despite the decreased outflow from Shasta Lake, peak flows at downstream points on the Sacramento River reached record high levels on January 24 and 25, primarily because of large inflows from tributary streams below the dam. For example, at Bend Bridge, about 44 miles downstream from Keswick Dam, a peak flow of about 158,000 cfs occurred early on January 24, principally due to the effect of high inflows from Cow Creek, Cottonwood Creek, and Battle Creek, plus other local inflow. At the time this peak occurred, the releases from Keswick Dam were 15,000 cfs. Further downstream, a flow in the range of 260,000-310,000 cfs occurred at the latitude of Ord Ferry, the head of the Sacramento River Flood Control Project, late on January 24. Much of this flow, together with overflow at Moulton and Colusa Weirs, and water from Butte Creek and Cherokee Canal, flowed into Butte Basin and ultimately into the Sutter Bypass.

On the morning of January 24, when it became apparent that peaks had occurred downstream from Shasta Dam at Bend Bridge and Red Bluff, and the river was receding, Keswick Dam releases were increased from 15,000 to 79,000 cfs, the maximum allowable under flood control regulations consistent with downstream requirements. This was the first time since 1958 that Shasta Lake was operated for flood control at the maximum 79,000 cfs release level.

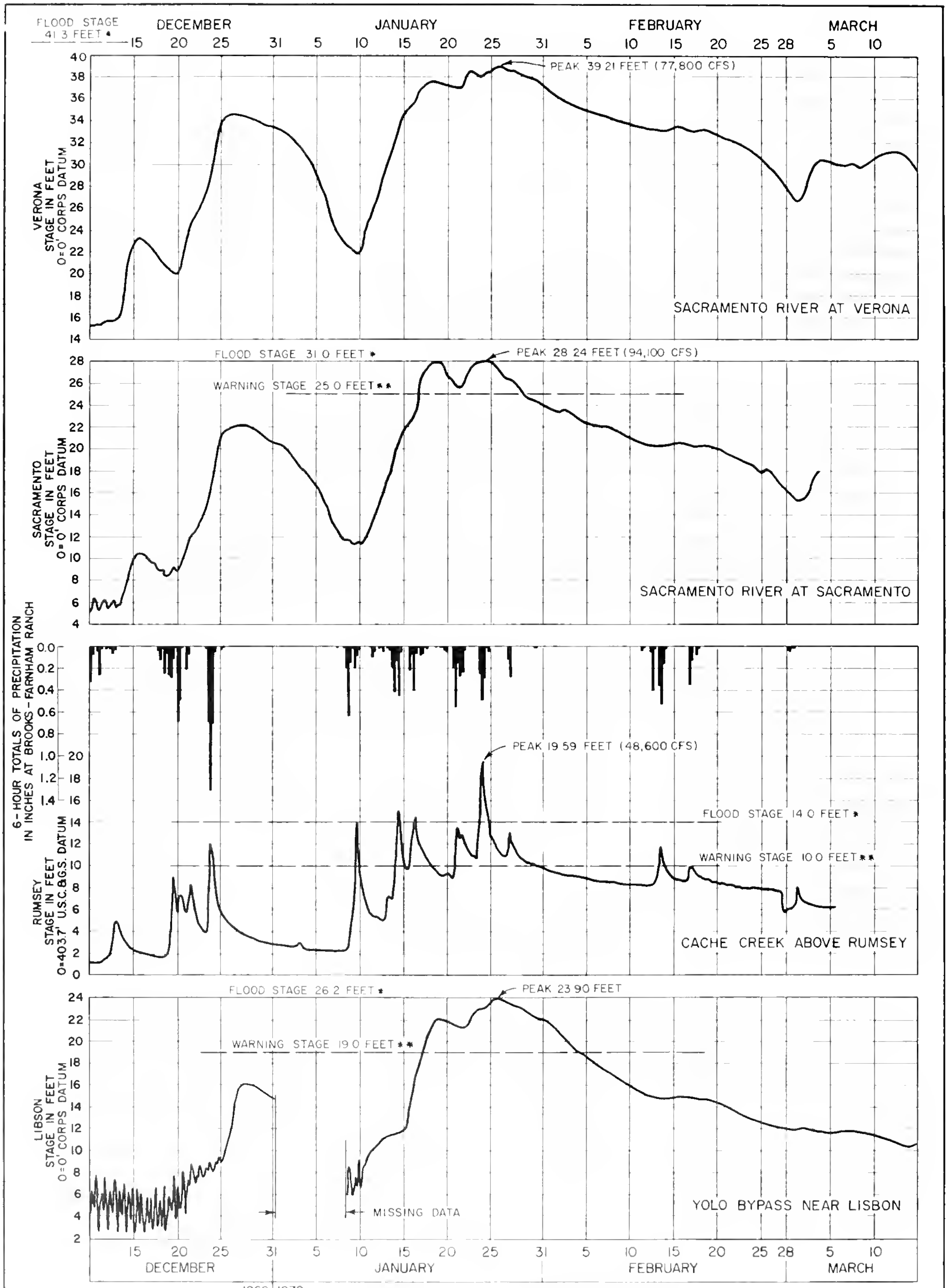
Other reservoirs in the Upper Sacramento River Basin also had high inflows during the January storm period. Stony Gorge and East Park Reservoirs, on Stony Creek, filled and spilled, while Black Butte Reservoir downstream had a peak inflow of about 36,000 cfs, with a maximum release of about 13,000 cfs, both on January 24. Whiskeytown Reservoir filled and started spilling also on January 24, reaching a maximum outflow to Clear Creek of about 6,000 cfs on January 27.

The high flows caused considerable damage in the upper portion of the basin. About 800 people were evacuated near Anderson when the Sacramento River went over its banks and threatened homes in the area. Other families were driven from their homes by the high water in the Colusa and Chico areas, and portions of the towns of Red Bluff, Hamilton City, and Tehama were flooded. A few homes were threatened at Sacramento Bar near Tehama when the river cut deeply into the bank. Glenn, Colusa, Butte, Sutter, Shasta, and Tehama Counties were declared disaster areas because of the heavy flood damage.

Further to the north, in the Pit River Basin, rain and flooding took a heavy toll. Highway bridges in the area were washed away or rendered unusable due to flooding of the approaches. Other highways were blocked by mudslides and washouts, and the town of Big Bend was completely cut off because of such occurrances. A levee on the Pit River washed away and the Lassen County community of Nubieber was inundated, leaving most of the 300 residents homeless. The town of Burney was flooded when Burney Creek overflowed, leaving several people homeless. Mudslides closed the railroad for several days, which delayed the shipment of lumber from the area's mills.

In Plumas County, flows in the North Fork of the Feather River severely eroded the banks of the river in the town of Chester. The erosion cut under rock fences and cabin foundations, filled a swimming pool with gravel, exposed pipelines, cut a street to about half its width, and cut new channels through backyards bordering the river.

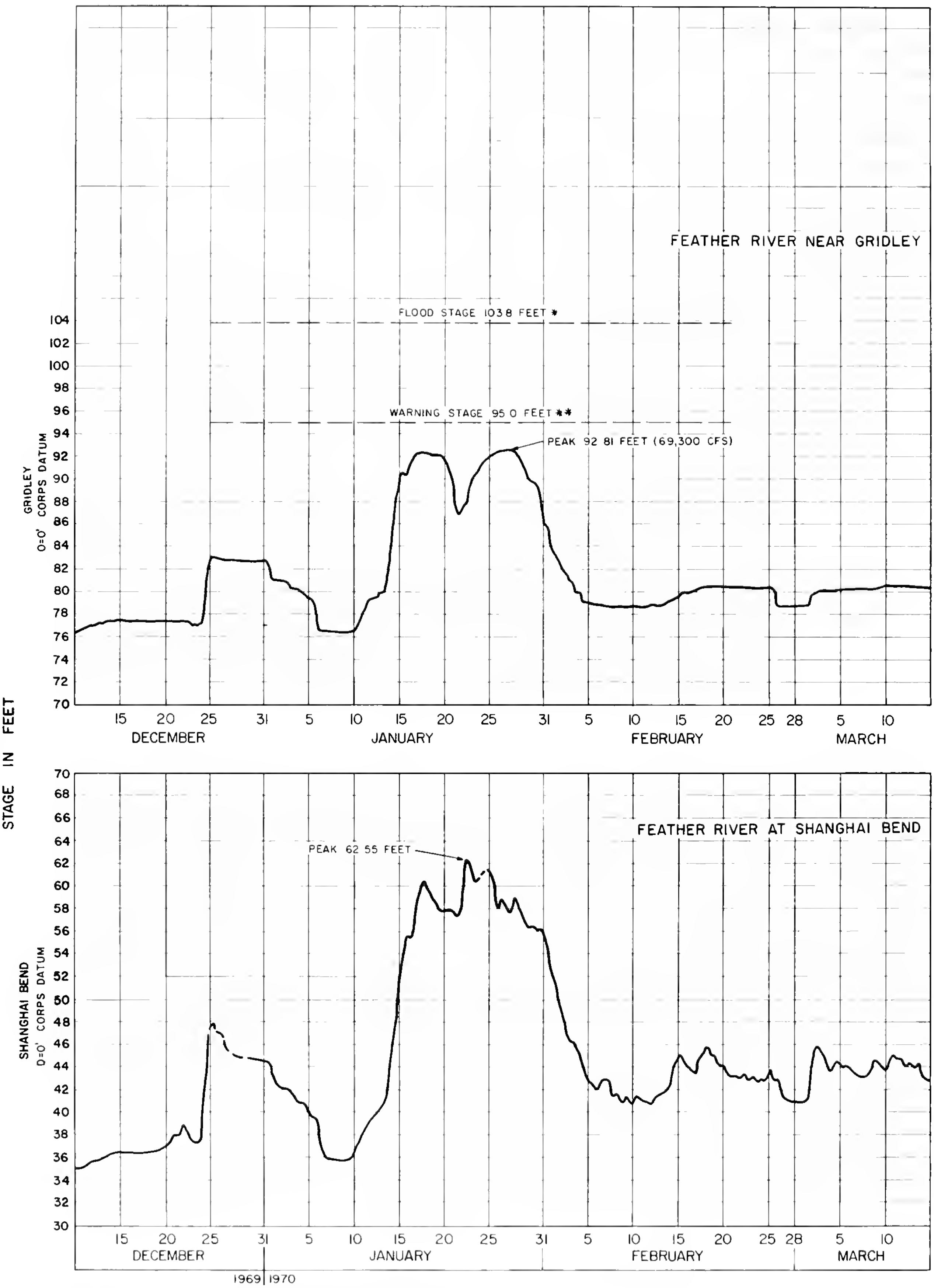
On the west side of the Central Valley the story was much the same. Clear Lake at the headwaters of Cache Creek received heavy local inflows, which caused the level of the lake to rise to flood levels. The surrounding area, including much of Lakeport, was flooded, with homes and resorts inundated and hundreds of people left homeless.



HYDROGRAPHS OF LOWER SACRAMENTO RIVER

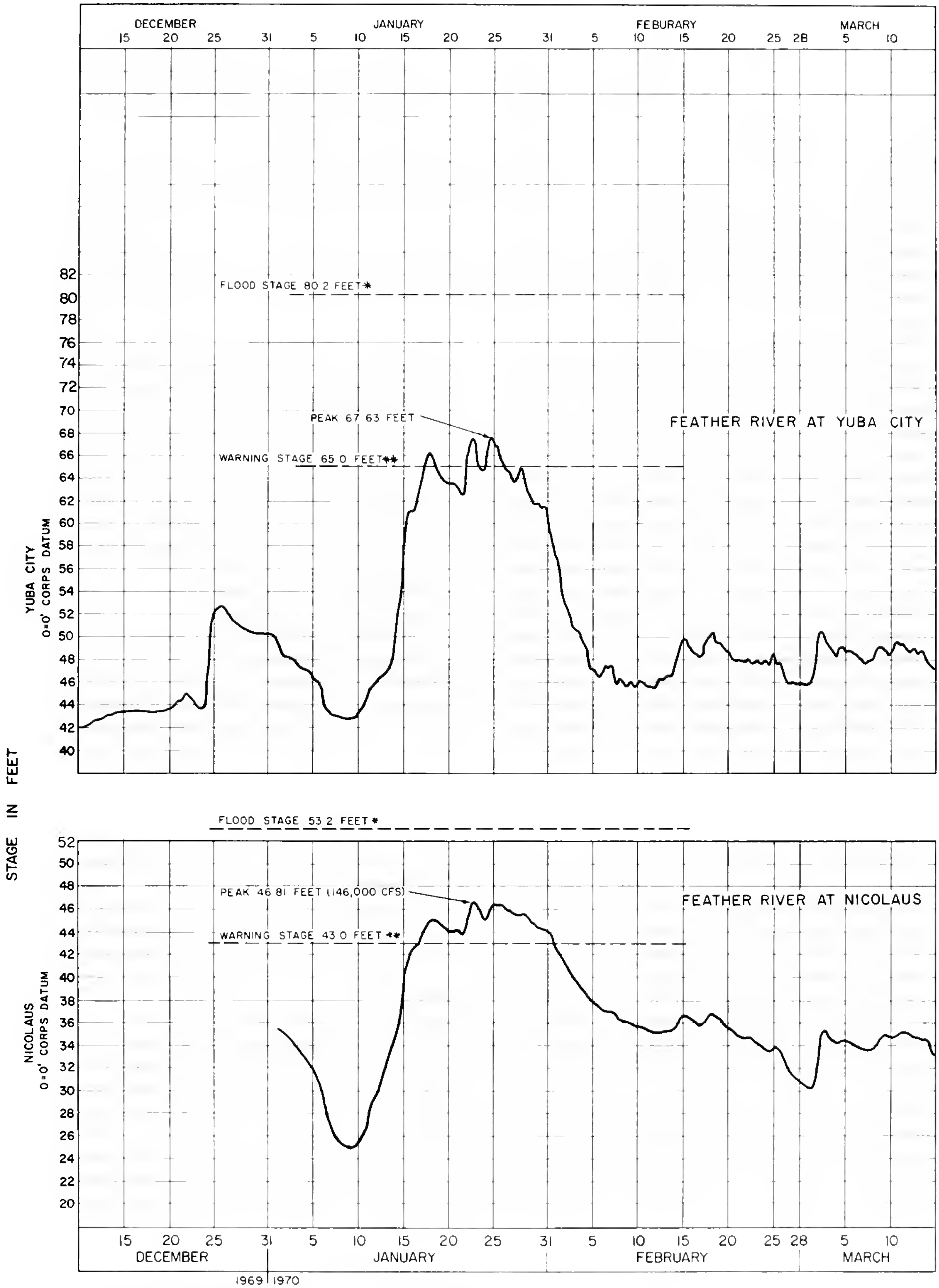
A little further to the south on Putah Creek, high inflows into Lake Berryessa behind Monticello Dam flooded the surrounding resort areas and local roads. About 200 people were stranded by the flooded roads, and several mobile homes, small buildings, and recreational areas filled with water as the level of the lake rose.

Record flows at Tehama caused flooding of the town and surrounding area. Photograph courtesy of The Corning Daily Observer.

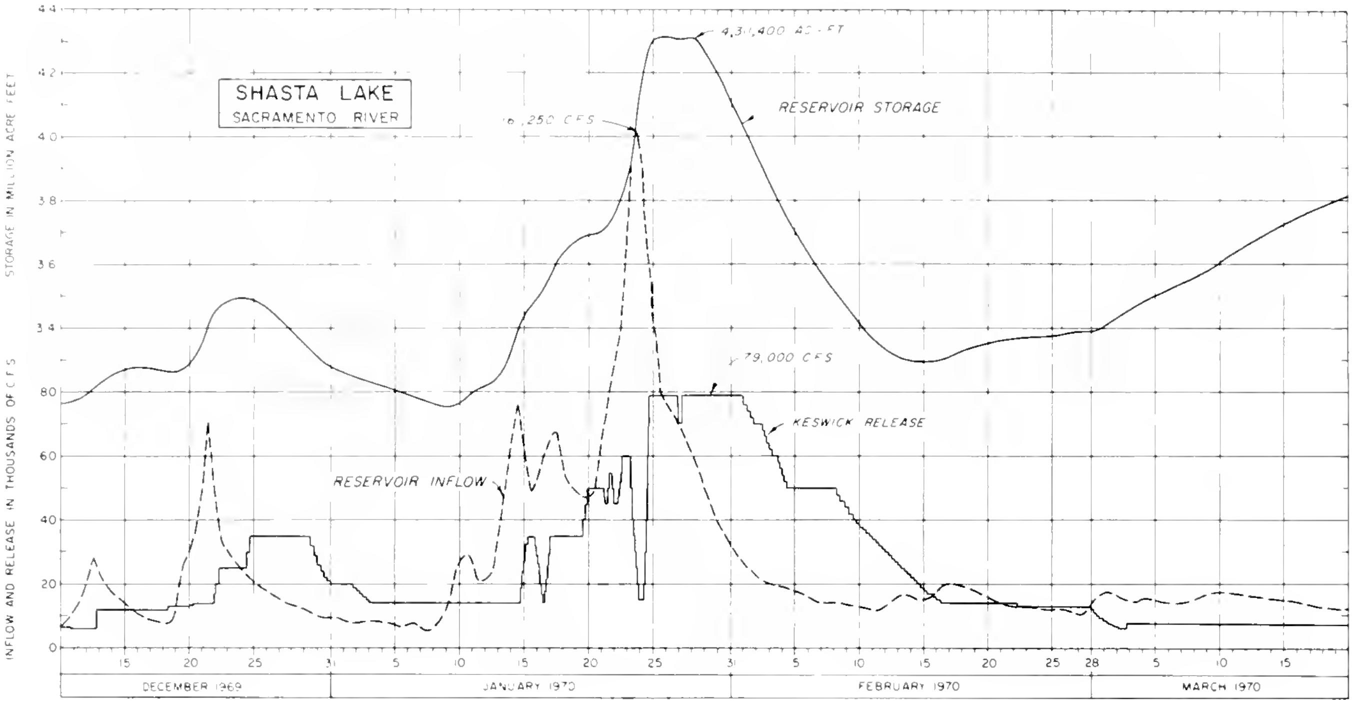


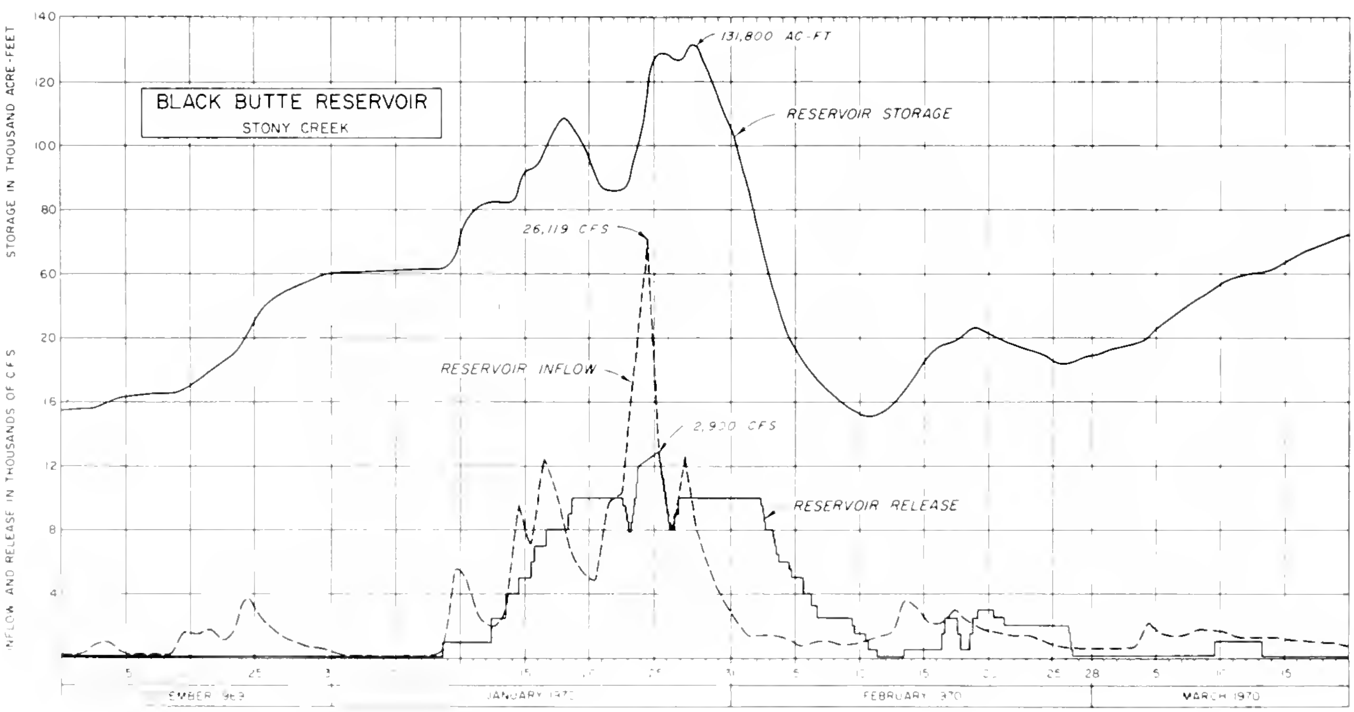
HYDROGRAPHS OF MIDDLE FEATHER RIVER

FLOOD STAGE - Nonleveed streams - stage at which significant overbanking occur
Leveed streams - stage at which design capacity of levee is reached
WARNING STAGE - Nonleveed streams - stage at which initial action must be taken.
Leveed streams - stage at which patrol of project levees becomes mandatory.



HYDROGRAPHS OF LOWER FEATHER RIVER





HYDROGRAPHS OF SHASTA LAKE AND BLACK BUTTE RESERVOIR

OPERATION OF DAMS

With the advent of the heavy rainfall, the dams and reservoirs of Northern California were used to restrain the massive runoff and ease the threat of flooding. The two major storage facilities in the North State, Shasta and Oroville Dams, along with the other dams of the area, held back the flood waters until the passage of the storms. The water was then released in a controlled manner when the rivers had subsided. Even though all of the reservoirs of the North State were operated for flood control, the following discussions deal only with the reservoirs which had a significant effect on the flood flows in the rivers.

Shasta Dam

Shasta Dam, on the upper Sacramento River, impounds Shasta Lake, which has a storage capacity of 4,500,000 acre-feet. Of this total, 1,300,000 acre-feet are operated as flood control. Releases to the river from Shasta Dam are regulated by Keswick Dam, which also regulates flow passing through the Spring Creek Tunnel from Whiskeytown Dam and Reservoir on the eastern slope of the Trinity Mountains. Keswick Reservoir, with a capacity of 23,800 acre-feet, is strictly a regulation reservoir with no flood control reservation.

During the 1970 water year,* the maximum inflow of record into Shasta Lake occurred on January 23, with a peak inflow of 210,000 cfs and a mean daily inflow of 161,250 cfs. Releases from Shasta Dam were kept low, and the water was allowed to collect in the reservoir until it was evident that the peak on the river generated mainly by runoff from below the dam had passed the Bend Bridge gaging station. At that time, releases from Keswick Dam were increased to the maximum of 79,000 cfs and held until the end of the month in order to vacate the flood reservation storage.

Shasta Lake reached a maximum storage for the year of 4,311,400 acre-feet on January 27. This was reduced with the flood control releases to 3,300,400 acre-feet by February 14. Storage in the reservoir was then allowed to increase until it reached a high of 4,112,900 acre-feet on May 27. The computed total unimpaired runoff to Shasta Lake during the water year was 7,901,000 acre-feet, or 149 percent of the 50-year average.

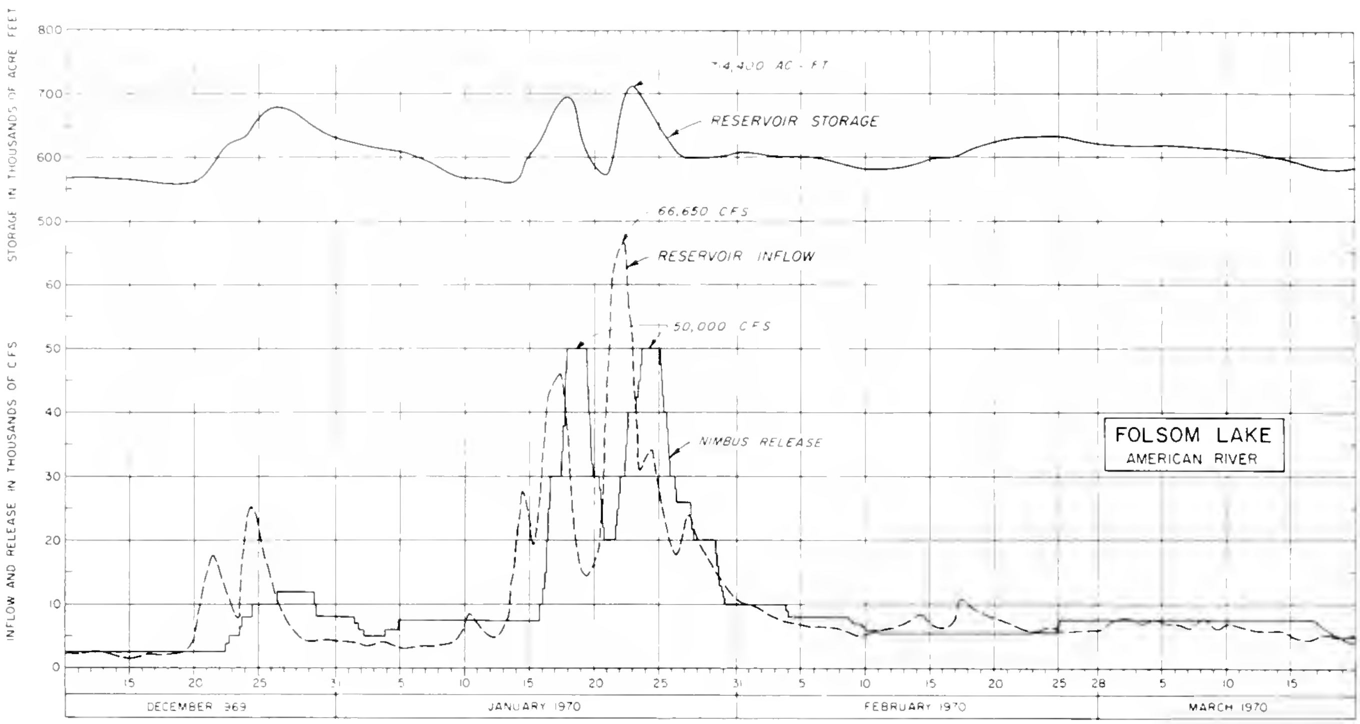
Hydrographs of the Shasta Dam complex, showing inflow and storage for Shasta Lake and releases from Keswick Reservoir to the Sacramento River, are shown on Plate 16.

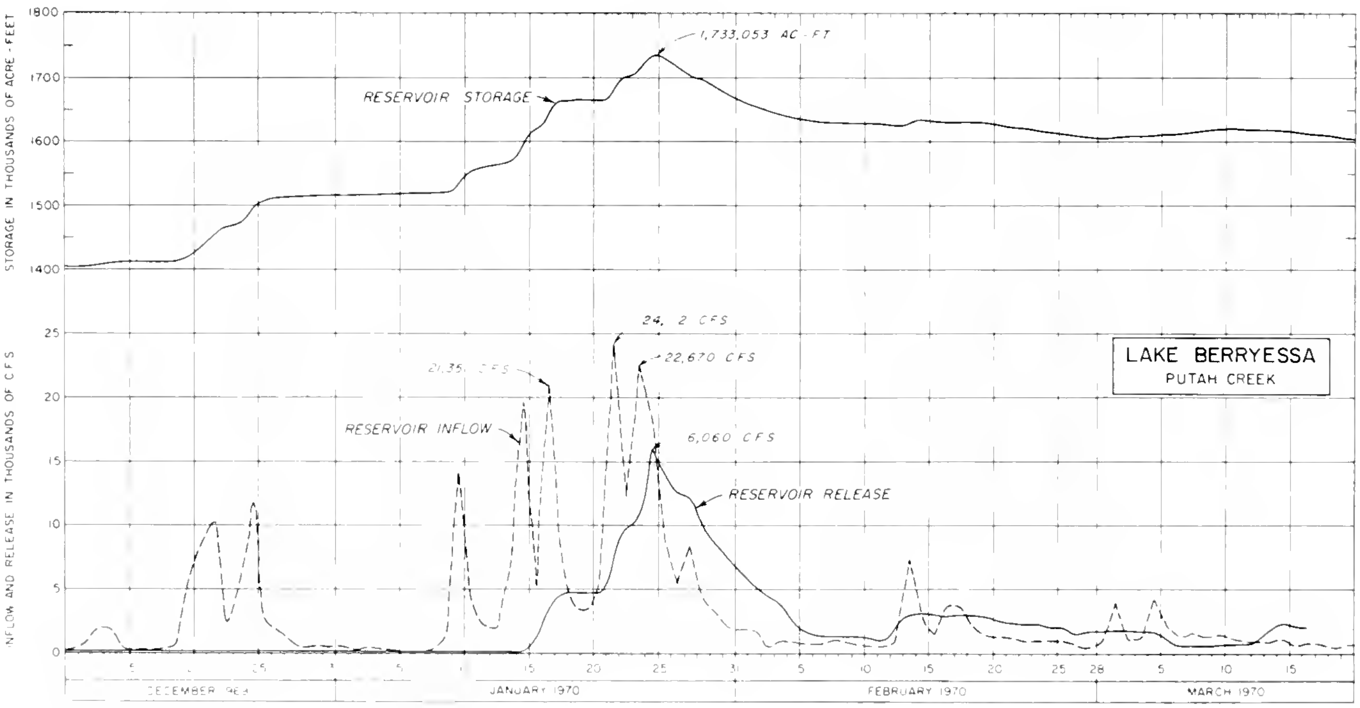
Black Butte Dam

Black Butte Dam and Reservoir is a flood control facility on Stony Creek, a tributary stream to the Sacramento River. The reservoir has a storage capacity of 160,000 acre-feet, of which 150,000 acre-feet is designated for flood control reservation.

December's storms caused the storage in the reservoir to increase slowly to about 60,000 acre-feet when the January storms moved into the area. The new storms brought heavy rain to the basin and caused five bursts of runoff into the reservoir. One of these periods had a peak inflow exceeding 26,000 cfs which caused the storage to increase to almost 130,000 acre-feet. During the rainy period, the reservoir releases were increased to 10,000 cfs and held near that level until the reservoir storage dropped to the desired flood control reservation.

*October 1, 1969 through September 30, 1970





HYDROGRAPHS OF FOLSOM AND BERRYESSA LAKES

Hydrographs of Black Butte Dam and Reservoir showing inflow, storage, and releases are shown on Plate 16.

Folsom Dam

Folsom Dam and Lake are located on the American River about 22 miles east of Sacramento. This lake has a storage capacity of 1,000,000 acre-feet, of which 400,000 acre-feet are reserved for flood control. The flow to the river downstream from the dam is regulated by Nimbus Dam, which creates Lake Natoma. Lake Natoma has a storage capacity of 8,760 acre-feet with no flood control reservation.

This storage development experienced no major problems from runoff, and during the flood control season, only three periods of high inflow occurred. All three of these inflows occurred during December and January, two of them in January within a week of each other. The first of these rises was caused by heavy rains which in turn caused storage in the lake to peak out near 696,500 acre-feet on January 17. Releases from the dam were increased to 50,000 cfs on the same day, and quickly reduced the storage to about 580,000 acre-feet on January 21.

Heavy rains in the basin again caused the lake level to increase rapidly and produced a peak storage for the season of 714,400 acre-feet on January 22. The releases from the dam were increased to 50,000 cfs once again to reduce the storage to flood control reservation. After January the reservoir fluctuated at lower levels until the flood season was over and was then allowed to fill from snowmelt. The computed total unimpaired runoff to Folsom Lake for the water year was 3,168,000 acre-feet, which is 126 percent of the 50-year average.

Hydrographs of the Folsom Dam complex, showing inflow and storage for Folsom Lake and releases from Nimbus Dam to the American River, are shown on Plate 17.

Monticello Dam

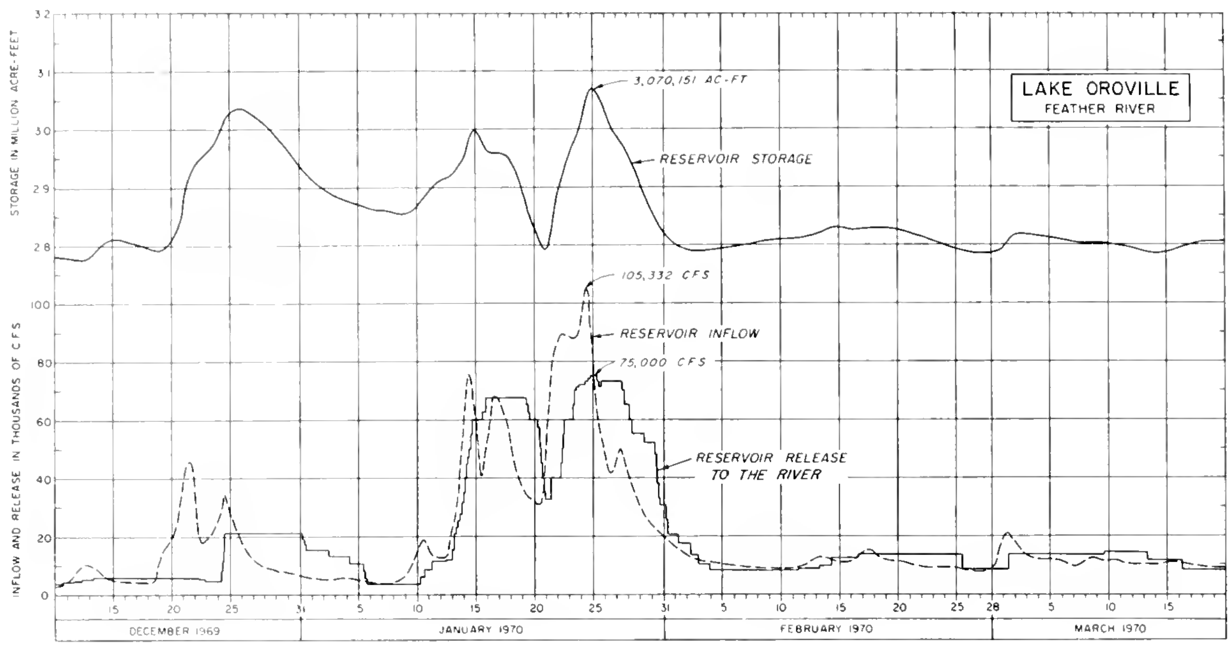
Monticello Dam on Putah Creek impounds Lake Berryessa, which has a storage capacity of 1,602,300 acre-feet when the water surface is at the crest of the dam's uncontrolled glory hole spillway. Lake Berryessa has no designated flood control reservation but does act to retain flood flows. The spillway will only allow a discharge which is proportional to the depth of water over the crest of the spillway. Therefore, the spill releases from the dam can be considerably less than the inflows during high runoff.

The January storms brought heavy amounts of rain to the Putah Creek Basin and resulted in high inflows to Lake Berryessa. Five significant peaks occurred during the month with three of these peaks well in excess of 20,000 cfs. Because of the high inflows, the storage in the lake increased to a high of 1,733,000 acre-feet on January 24. On this same day, the flow over the spillway peaked at 16,000 cfs--substantially lower than the inflows. The spillway had begun flowing on January 14 and continued to flow through March. During this time, well over 400,000 acre-feet of water passed downstream through Monticello Dam.

Hydrographs of Monticello Dam showing inflow, storage and spillway releases to Putah Creek are shown on Plate 17.

Oroville Dam

Oroville Dam, located on the Feather River about six miles east of Oroville, impounds Lake Oroville. This lake has a maximum storage of 3,538,000 acre-feet, which includes 750,000 acre-feet of flood control reservation. Low flows to the Feather River below the dam are regulated by Thermalito Afterbay, a tailwater reservoir for Thermalito Powerplant, which is part of the Oroville power complex. Flood control releases from Oroville Dam do not pass



HYDROGRAPH OF LAKE OROVILLE

Flood Control Releases at Oroville Dam.
DWR Photograph

through Thermalito Afterbay but instead flow over the Thermalito Diversion Dam directly into the river.

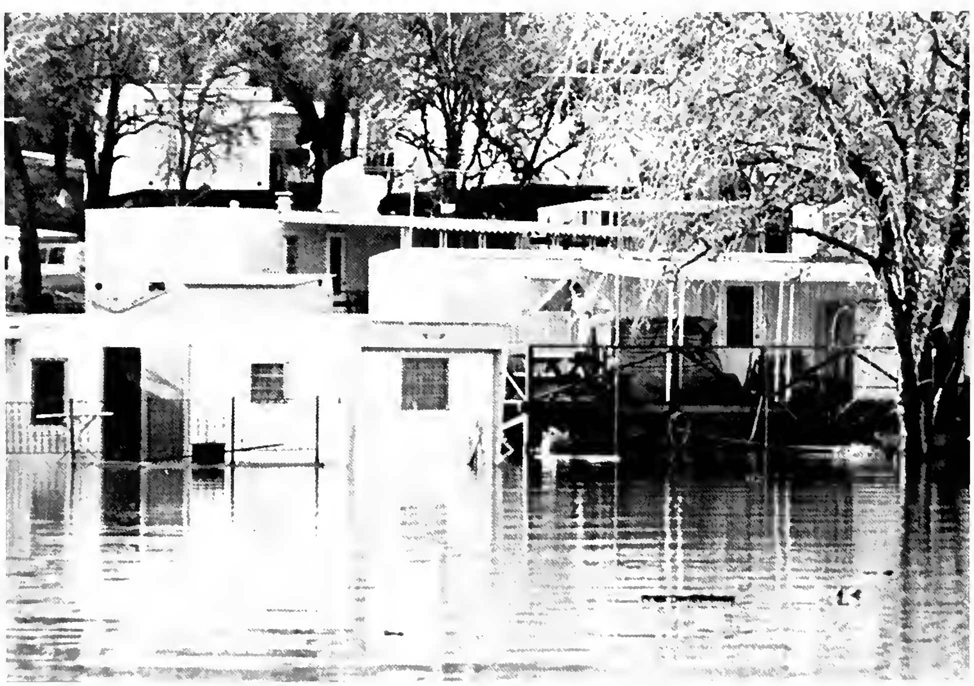
The December storms caused enough inflow into the lake to increase the storage to slightly above 3,000,000 acre-feet on Christmas Day. Releases from the dam were increased to 21,000 cfs, reducing the storage to about 2,850,000 acre-feet before the January storms set in.

During the January storms, the Feather River had three significant periods of inflow to Lake Oroville. The first two of these occurred within a few days of each other and caused the storage in the lake to exceed 3,000,000 acre-feet again. At this time, releases from the dam were increased to 67,500 cfs, which quickly reduced the storage to near 2,800,000 acre-feet. A heavy burst of rain in the Feather Basin over a four-day period caused high inflows to the lake once again. This time the inflows increased, with a peak of 146,400 cfs and a mean daily inflow of 105,332 cfs, which increased the lake storage to over 3,000,000 acre-feet again. With this rise, the releases were increased to over 70,000 cfs, enabling the storage to be reduced to 2,800,000 acre-feet once again.

Because the remainder of the season produced little additional precipitation in the basin, the lake level fluctuated near this level until the end of the flood season. As the snow in the mountains began melting, the lake was allowed to fill, and it reached a maximum storage for the year of 3,094,500 acre-feet on May 31. The total unimpaired runoff to Lake Oroville during the 1969-70 water year was 6,066,000 acre-feet, which is 146 percent of the fifty-year average.

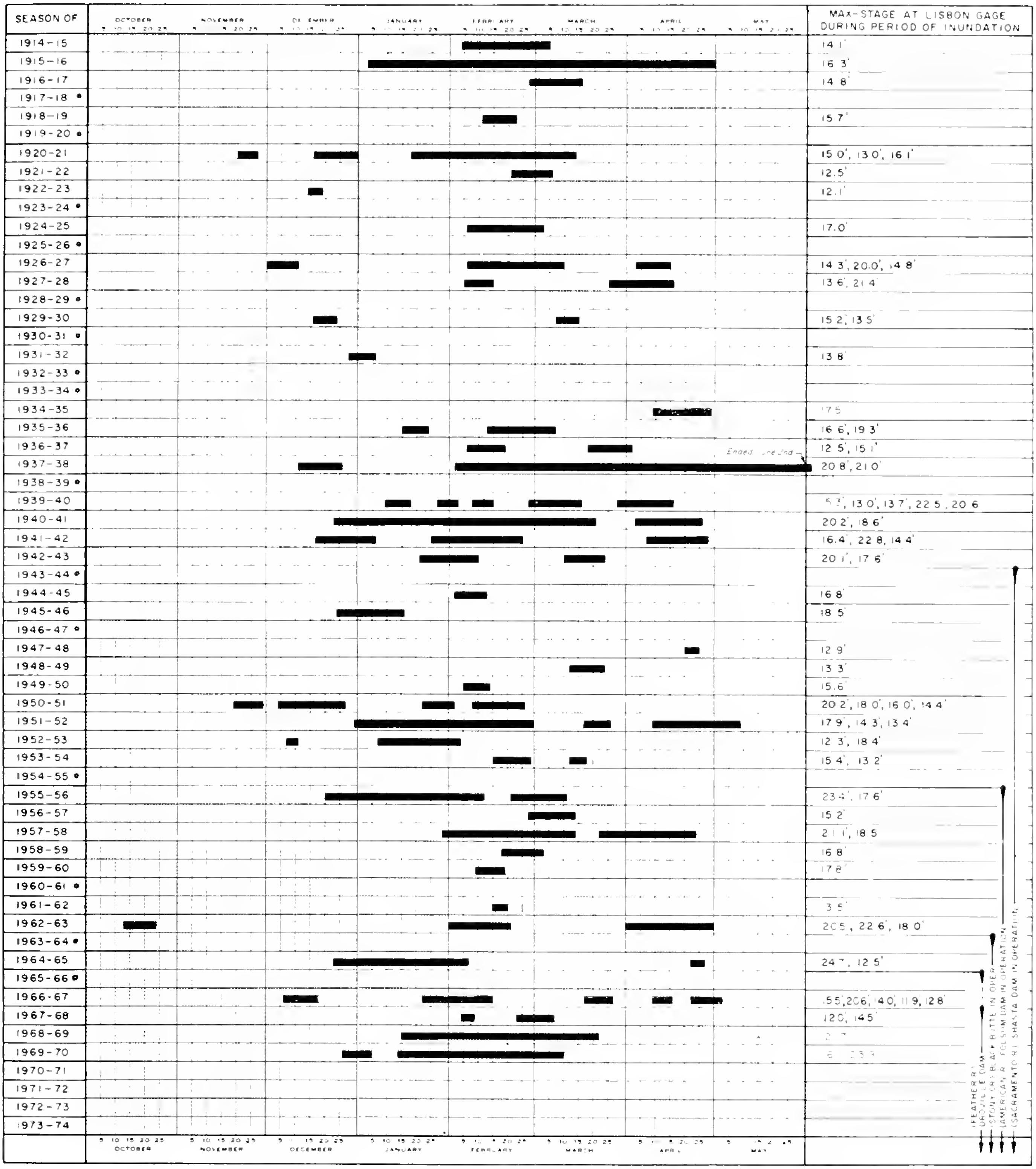
Hydrographs showing the inflow and storage for Lake Oroville and releases to the Feather River are shown on Plate 18.

The City of Lakeport on the shores of Clear Lake was flooded when the lake rose. Photograph courtesy of The Sacramento Bee.



Flooding at Lake Berryessa inundated several resort areas. Photograph taken by Robert Yeager - Courtesy of The Register of Napa, California.

PERIOD OF RECORD OF INUNDATION OF THE YOLO BYPASS



NOTE

Data compiled from records of D.W.R. stream gaging station "Yolo Bypass near Lisbon."

Datum: 0=U.S.E.D. Datum

Period of Record: 1914 to Present

Assumed overflow of Bypass at stage above 11.5' on the Lisbon gage

LEGEND

▬ Designates period of inundation of Bypass

• Designates season Bypass not inundated

DEPARTMENT OF WATER RESOURCES
FLOOD CONTROL MAINTENANCE SECTION

TABLE 3

PEAK FLOWS AND STAGES
(PRELIMINARY DATA-SUBJECT TO REVISION)

STREAM AND STATION	DRAINAGE AREA IN SQ MILES	PERIOD OF RECORD	SOURCE OF RECORD	PREVIOUS MAXIMUM OF RECORD DATE	PREVIOUS MAXIMUM OF RECORD STAGE IN FEET	PREVIOUS MAXIMUM OF RECORD DISCHARGE IN CFS	1969-1970 WATER YEAR DATE	1969-1970 WATER YEAR STAGE IN FEET	1969-1970 WATER YEAR DISCHARGE IN CFS
NORTH COASTAL AREA									
SMITH RIVER NEAR CRESCENT CITY	609	1931-	USGS	12-22-64	48.5	228,000	1-22-70	35.50	118,000
SHASTA RIVER NEAR YREKA	793	1933-41 1944-	USGS	12-22-64	12.9	21,500	1-27-70	8.84	5,570
SCOTT RIVER NEAR FORT JONES	653	1941-	USGS	12-22-64	25.3(A)	54,600	1-24-70	14.12	10,200
KLAMATH RIVER NEAR SEIAD VALLEY	6980	1912-25 1951-	USGS	12-23-64	33.8(A)	165,000	1-24-70	20.24	56,000
SALMON RIVER AT SOMEBAR	751	1911-	USGS	12-22-64	46.6	133,000	1-24-70	20.07	51,000
KLAMATH RIVER AT ORLEANS	8500	1927-	USGS	12-22-64	76.5(A)	307,000	1-24-70	28.30	165,000
TRINITY RIVER ABOVE COFFEE CREEK NEAR TRINITY CENTER	149	1957-	USGS	12-22-64	12.3	20,800	12-21-69	10.70	13,600
TRINTIY RIVER AT LEWISTON	728	1911-	USGS	12-22-55	27.3(A)	71,600	1-27-70	8.10	6,500
NORTH FORK TRINITY RIVER AT HELENA	151	1911-13 1957	USGS-DWR	12-22-64	27.9(A)	35,800	1-23-70	19.34	12,680
TRINITY RIVER NEAR BURNT RANCH	1439	1931-40 1956	USGS	12-22-55	43.2(A)	172,000	1-27-70	19.74	35,000
NEW RIVER AT DENNY	173	1927-28 1959-	USGS	12-22-64	38.7(A)	60,000(E)	STATION DISCONTINUED		
HAYFORK CREEK NEAR HYAMPOM	378	1953-	USGS	12-22-64	19.1	28,800	1-24-70	16.34	19,500
WILLOW CREEK NEAR WILLOW CREEK	41	1959-	USGS	12-22-64	20.6	17,000	1-27-70	- -	2,800(E)
TRINITY RIVER AT HOOPA	2847	1911-	USGS	12-22-64	40.3(A)	231,000	1-24-70	33.70	110,000
KLAMATH RIVER NEAR KLAMATH	12100	1910-	USGS	12-23-64	55.3(A)	557,000	1-24-70	36.08	328,000
REDWOOD CREEK AT ORICK	278	1911-13 1953	USGS	12-22-64	24.0(A)	50,500	1-27-70	18.59	28,000
LITTLE RIVER AT CRANNEL	44	1955-	USGS	1- 4-66	11.1	8,300	1-26-70	10.43	7,410
MAD RIVER NEAR FOREST GLEN	143	1953-	USGS	12-22-55	24.5(A)	39,200	1-24-70	12.17	11,700
MAD RIVER NEAR ARCATA	485	1910-13 1950-	USGS	12-22-55	29.8	77,800	1-24-70	18.23	31,000
EEL RIVER BELOW SCOTT DAM NEAR POTTER VALLEY	290	1922-	USGS	12-22-64	24.2(A)	56,300	1-23-70	19.43	29,200
EEL RIVER AT VAN ARSDALE DAM NEAR POTTER VALLEY	349	1909-	USGS	12-22-64	33.3(A)	64,100	1-23-70	25.66	36,200
OUTLET CREEK NEAR LONGVALE	161	1956-	USGS	12-22-64	30.6(A)	77,900	1-23-70	17.93	21,000
BLACK BUTTE RIVER NEAR COVELO	162	1951-	USGS	12-22-64	26.4(A)	29,000	1-23-70	24.10	20,400
NORTH FORK EEL RIVER NEAR MINA	248	1953-	USGS	12-22-64	33.6(A)	133,000	1-23-70	19.60	29,000
EEL RIVER AT FORT SEWARD	2107	1955-	USGS	12-22-64	67.2(A)	561,000	1-23-70	50.50(E)	225,000
SOUTH FORK EEL RIVER NEAR BRANSCOMB	44	1946-	USGS	12-22-55	16.2	26,100	1-23-70	11.53	9,510
TENMILE CREEK NEAR LAYTONVILLE	50	1957-	USGS	12-22-55	22.9(A)	16,300	1-23-70	14.70	8,000

TABLE 3 (CONTINUED)

STREAM AND STATION	DRAINAGE AREA IN SQ. MILES	PERIOD OF RECORD	SOURCE OF RECORD	PREVIOUS MAXIMUM OF RECORD: DATE	PREVIOUS MAXIMUM OF RECORD: STAGE IN FEET	PREVIOUS MAXIMUM OF RECORD: DISCHARGE IN CFS	1969-1970 WATER YEAR: DATE	1969-1970 WATER YEAR: STAGE IN FEET	1969-1970 WATER YEAR: DISCHARGE IN CFS
NORTH COASTAL AREA (CONTINUED)									
SOUTH FORK EEL RIVER NEAR MIRANDA	537	1939-	USGS	12-22-64	46.0(A)	199,000	1-23-70	27.87	85,000
BULL CREEK NEAR WEOTT	28	1960-	USGS	12-22-64	20.6(A)	6,520	1-22-70	12.44	4,300
EEL RIVER AT SCOTIA	3113	1910-	USGS	12-23-64	72.0(A)	752,000	1-24-70	46.70	328,000
VAN DUZEN RIVER NEAR BRIDGEVILLE	222	1950-	USGS	12-22-64	24.0(A)	48,700	12-21-69	20.06	33,500
MATTOLE RIVER NEAR PETROLIA	240	1911-	USGS	12-22-55	29.6	90,400	1-23-70	18.47	28,400
NOYO RIVER NEAR FORT BRAGG	106	1951-	USGS	12-22-64	26.3	24,000	1-24-70	22.28	13,300
NAVARRO RIVER NEAR NAVARRO	303	1950-	USGS	12-22-55	40.8	64,500	1-24-70	33.41	37,000
SOUTH FORK GUALALA RIVER NEAR ANNAPOLIS	161	1950-	USGS	12-22-55	24.6	55,000	1-23-70	20.68	35,900
RUSSIAN RIVER NEAR UKIAH	100	1911-	USGS	12-21-55	21.0	18,900	1-23-70	13.41	10,600
EAST FORK RUSSIAN RIVER NEAR CALPELLA	92	1941-	USGS	12-22-64	20.2	18,700	1-23-70	20.13	11,000
RUSSIAN RIVER NEAR HOPLAND	362	1939-	USGS	12-22-55	27.0	45,000	1-24-70	21.58	27,800
RUSSIAN RIVER NEAR CLOVERDALE	502	1951-	USGS	12-22-64	31.6	55,200	1-23-70	25.46	35,900
BIG SULPHUR CREEK NEAR CLOVERDALE	82	1957-	USGS	12-22-55	16.8(A)	20,000	1-23-70	13.94	13,000
RUSSIAN RIVER NEAR HEALDSBURG	793	1939-	USGS	12-23-64 2-28-40	27.0 30.0	71,300	1-24-70	22.08	53,500
DRY CREEK NEAR CLOVERDALE	88	1941-	USGS	12-22-64	18.1	18,100	1-23-70	15.85	14,400
DRY CREEK NEAR GEYSERVILLE	162	1959-	USGS	1-31-63	17.5	32,400	1-23-70	16.42	26,300
SANTA ROSA CREEK NEAR SANTA ROSA	13	1959-	USGS	2- 8-60	13.4	3,200	1-21-70	10.99	1,840
RUSSIAN RIVER NEAR GUERNEVILLE (SUMMERHOME)	1340	1939-	USGS	12-23-64	49.6(A)	93,400	1-24-70	43.95	72,900
SAN FRANCISCO BAY AREA									
WALKER CREEK NEAR TOMALES	37	1959-	USGS	1- 5-66	22.2	5,420	1-21-70	21.56	4,520
CORTE MADERA CREEK AT ROSS	18	1951-	USGS	12-22-55	17.5	3,620	12-20-69	17.97	3,290
NOVATO CREEK NEAR NOVATO	18	1946-	USGS	1-20-64	8.74(C)	1,330	1-14-70	11.01	2,000
SONOMA CREEK AT AGUA CALIENTE	58	1955-	USGS	12-22-55	17.1(C)	8,880	1-21-70	13.57	6,580
NAPA RIVER NEAR ST. HELENA	81	1929-	USGS	12-22-55	16.2	12,600	1-24-70	13.81	9,400
NAPA RIVER NEAR NAPA	218	1929-	USGS	2-31-63	27.6	16,900	1-24-70	21.95	11,400
REDWOOD CREEK NEAR NAPA	10	1958-	USGS	1- 5-65	10.4	1,450	1-14-70	8.39	1,210
SAN RAMON CREEK AT SAN RAMON	6	1952-	USGS	10-13-62	17.0	1,600	1-21-70	5.74	504
SAN RAMON CREEK AT WALNUT CREEK	51	1952-	USGS	1-31-63	14.4	7,980	STATION DISCONTINUED		

TABLE 3 (CONTINUED)

STREAM AND STATION	DRAINAGE AREA IN SQ MILES	PERIOD OF RECORD	SOURCE OF RECORD	PREVIOUS MAXIMUM OF RECORD			1969-1970 WATER YEAR		
				DATE	STAGE IN FEET	DISCHARGE IN CFS	DATE	STAGE IN FEET	DISCHARGE IN CFS
				SAN FRANCISCO BAY AREA (CONTINUED)					
SAN LORENZO CREEK AT HAYWARD	38	1939-	USGS	10-13-62	19.7(A)	7,460	1-21-70	13.32	2,990
ARROYO MOCHO NEAR PLEASANTON	141	1962-	USGS	2- 1-63	8.60	1,760	1-21-70	12.07	407
ARROYO VALLE NEAR LIVERMORE	147	1912-	USGS	12-23-55	13.9(A)	18,200			NO PEAK
ARROYO VALLE AT PLEASANTON	171	1957-	USGS	4- 3-58	25.4	11,300	1-16-70	7.03	103
ALAMEDA CREEK NEAR NILES	633	1891-	USGS	12-23-55	14.9	29,000	1-21-70	8.71	6,340
PATTERSON CREEK AT UNION CITY	-	1958-	USGS	3- 1-63	20.4(A)	10,500	1-21-70	12.38	5,530
ALAMEDA CREEK AT UNION CITY	653	1958-	USGS	3- 1-63	19.3(A)	1,770	1-21-70	10.83	46
COYOTE CREEK NEAR MADRONE	196	1902-	USGS	3- 7-11	- - -	25,000	1-30-70	2.73	163
UPPER PENITENCIA CREEK AT SAN JOSE	22	1961	USGS	3-28-63	3.5	295	3 -1-70	4.46	228
ALAMITOS CREEK NEAR NEW ALMADEN	32	1958-	USGS	4- 2-58	9.7	4,300	3 -1-70	3.29	460
LOS GATOS CREEK AT LOS GATOS	37	1929-	USGS	2-27-40	14.7(C)	7,110	1-14-70	4.41	76
GUADELUPE RIVER AT SAN JOSE	144	1929-	USGS	4- 2-58	16.6	9,150	1-14-70	4.76	1,460
SARATOGA CREEK AT SARATOGA	9	1933-	USGS	12-22-55	6.4	2,730	1-16-70	4.65	430
MATADERO CREEK AT PALO ALTO	7	1952-	USGS	12-22-55	9.6(C)	854	3 -4-70	3.05	539
SAN FRANCISQUITO CREEK AT STANFORD UNIVERSITY	38	1930-	USGS	12-22-55	13.6	5,560	1-21-70	7.44	3,110
REDWOOD CREEK AT REDWOOD CITY	2	1959-	USGS	1-31-63	9.4	644	1-23-70	5.74	257
PESCADERO CREEK NEAR PESCADERO	46	1951-	USGS	12-23-55	21.3	9,420	1-16-70	10.66	2,270
				CENTRAL COASTAL AREA					
SAN LORENZO RIVER AT BIG TREES	111	1936-	USGS	12-23-55	22.6	[illegible],400	1-16-70	12.73	[illegible]
BRANCIFORTE CREEK AT SANTA CRUZ	17	1941-43 1952-	USGS	12-22-55	[illegible]	[illegible],100	STATION DISCONTINUED		
SOQUEL CREEK AT SOQUEL	40	1951-	USGS	12-23-55	22.3	15,300	1-16-70	11.40	3,680
LLAGAS CREEK NEAR MORGAN HILL	20	1951-	USGS	4- 2-58	[illegible]	3,190	STATION DISCONTINUED		
BODFISH CREEK NEAR GILROY	7	1959-	USGS	1-31-63	8.3	1,240	1-15-70	7.08	630
TRES PINOS CREEK NEAR TRES PINOS	206	1939-	USGS	4- 4-41	7.8	[illegible],060	1-16-70	[illegible].78	766
SAN BENITO RIVER NEAR HOLLISTER	586	1949-	USGS	4- 3-58	16.3	11,600	1-16-70	[illegible]	1,120
PAJARO RIVER AT CHITTENDEN	1186	1939-	USGS	12-24-55 4- 3-58	[illegible] 3[illegible].1	[illegible]	1-[illegible]-70	[illegible]	[illegible],420
CORRALITOS CREEK NEAR CORRALITOS	11	1957-	USGS	4- 2-58	7.6	1,[illegible]70	1-15-70	6.27	1,120
CORRALITOS CREEK AT FREEDOM	[illegible]	1956-	USGS	12-22-55	[illegible](A)	[illegible]	1-21-70	[illegible]	1,[illegible]30

TABLE 3 (CONTINUED)

STREAM AND STATION	DRAINAGE AREA IN SQ MILES	PERIOD OF RECORD	SOURCE OF RECORD	PREVIOUS MAXIMUM OF RECORD DATE	PREVIOUS MAXIMUM OF RECORD STAGE IN FEET	PREVIOUS MAXIMUM OF RECORD DISCHARGE IN CFS	1969-1970 WATER YEAR DATE	1969-1970 WATER YEAR STAGE IN FEET	1969-1970 WATER YEAR DISCHARGE IN CFS
CENTRAL COASTAL AREA (CONTINUED)									
SALINAS RIVER NEAR POZO	70	1942-	USGS	1-25-69	13.9	18,600	3 -4-70	11.29	652
SALINAS RIVER ABOVE PHILITAS CREEK NEAR SANTA MARGARITA	114	1942-	USGS	4- 3-58	6.7	4,720	3 -4-70	.90	12
JACK CREEK NEAR TEMPLETON	25	1949-	USGS	1-25-56	9.6	5,040	1-16-70	7.44	2,310
ESTRELLA RIVER NEAR ESTRELLA	922	1954-	USGS	2-24-69	10.4(A)	32,500	3 -5-70	2.62	183
NACIMIENTO RIVER NEAR BRYSON	140	1955-	USGS	1-25-69	24.6	39,100	1-16-70	17.86	20,000
SALINAS RIVER NEAR BRADLEY	2535	1948-	USGS	2-24-69	20.3(A)	117,000	1-17-70	8.07	4,190
ARROYO SECO NEAR SOLEDAD	244	1901	USGS	4- 3-58	16.4	28,300	1-16-70	11.19	9,980
SALINAS RIVER NEAR SPRECKELS	4156	1900-	USGS	2-26-69 1-16-52	26.5(C) 26.9(A)	83,100	1-17-70	9.03	4,220
BIG SUR RIVER NEAR BIG SUR	47	1950-	USGS	4- 2-58	11.6	5,680	1-16-70	9.00	3,340
ARROYO DE LA CRUZ NEAR SAN SIMEON	41	1950-	USGS	12- 6-66	15.3	35,200	1-16-70	10.98	12,200
SANTA ROSA CREEK NEAR CAMBRIA	13	1957-	USGS	1-25-69 12- -55	12.0 15.2(A)	3,350	1-16-70	8.83	1,790
SISQUOC RIVER NEAR GAREY	471	1940-	USGS	1-25-69	13.0	24,500	3 -1-70	9.45	1,020
CARMEL RIVER AT ROBLES DEL RIO	193	1957	USGS	4- 2-58	10.5	7,100	1-16-70	8.45	3,120
SANTA MARIA RIVER AT GUADALUPE	1741	1940-	USGS	1-16-52	8.2(C)	32,800	3 -5-70	5.83	42
SANTA YNEZ RIVER BELOW GIBARALTAR DAM NEAR SANTA BARBARA	216	1920-	USGS	1-25-69	25.8	54,200	2-28-70	13.19	4,320
SANTA CRUZ CREEK NEAR SANTA YNEZ	74	1941-	USGS	2-24-69	14.5(A)	7,050	3 -1-70	10.32	910
SAN JOSE CREEK NEAR GOLETA	6	1941-	USGS	1-25-69	10.1	2,000	2-28-70	4.12	340
ATASCADERO CREEK NEAR GOLETA	19	1941-	USGS	1-25-69	13.0	5,230	3 -1-70	9.05	820
CARPINTERIA CREEK NEAR CARPINTERIA	13	1941-	USGS	1-25-69	14.9	4,560	3 -1-70	5.07	300
MATILIJA CREEK AT MATILIJA HOT SPRINGS	55	1927-	USGS	1-25-69	16.5	20,000	3 -2-70	4.14	496
VENTURA RIVER NEAR MEINERS OAKS	76	1959-	USGS	11-25-69	- - -	28,000	3 -2-70	5.20	258
COYOTE CREEK NEAR OAK VIEW	13	1958-	USGS	11-25-69	12.0	8,000	3 -1-70	8.30	250
VENTURA RIVER NEAR VENTURA	188	1911-14 1929-	USGS	1-25-69	24.3(A)	58,000	3 -1-70	8.04	1,570
SAN CLARA RIVER AT LOS ANGELES-VENTURA CO. LINE	644	1952-	USGS	1-25-69	19.0	68,800	3 -2-70	5.04	992
PIRU CREEK ABOVE LAKE PIRU	372	1955-	USGS	2-25-69	18.6(A)	31,200	2-28-70	8.10	2,150
SESPE CREEK NEAR FILLMORE	251	1911-13 1927	USGS	1-25-69	20.8	60,000	2-28-70	16.20	8,800
SANTA PAULA CREEK NEAR SANTA PAULA	40	1927-	USGS	2-25-69	15.2	21,000	2-28-70	7.55	940

TABLE 3 (CONTINUED)

STREAM AND STATION	DRAINAGE AREA IN SQ MILES	PERIOD OF RECORD	SOURCE OF RECORD	PREVIOUS MAXIMUM OF RECORD DATE	PREVIOUS MAXIMUM OF RECORD STAGE IN FEET	PREVIOUS MAXIMUM OF RECORD DISCHARGE IN CFS	1969-1970 WATER YEAR DATE	1969-1970 WATER YEAR STAGE IN FEET	1969-1970 WATER YEAR DISCHARGE IN CFS
SOUTH COASTAL AREA									
MALIBU CREEK AT CRATER CAMP NEAR CALABASAS	105	1931-	USGS	1-25-69	21.4	33,800	3 -4-70	5.66	1,150
BALLONA CREEK NEAR CULVER CITY	90	1928-	USGS	11-21-67	14.9	32,500	3 -4-70	6.80	7,840
LOS ANGELES RIVER AT SEPULVEDA DAM	158	1929-	USGS	1-25-69	11.4	13,800	2-28-70	7.92	8,180
LOS ANGELES RIVER AT LOS ANGELES	514	1929-	USGS	3- 2-38	- - -	67,000	3 -4-70	7.55	25,700
RIO HONDO NEAR DOWNEY	143	1928-	USGS	1-25-69	12.0	46,900	3 -4-70	5.65	7,980
SANTA ANA RIVER NEAR MENTONE	209	1896-	USGS	3- 2-38	14.3	52,300	2-28-70	4.13	420
SAN GABRIEL RIVER NEAR AZUSA	214	1895-	USGS	3- 2-38	- - -	65,700	STATION DISCONTINUED		
SAN GABRIEL RIVER BELOW SANTA FE DAM NEAR BALDWIN PARK	236	1942-	USGS	1-26-69	22.2	30,900	3 -4-70	11.23	458
SANTA ANA RIVER AT E ST NEAR SAN BERNARDINO	523	1939-54 1966	USGS	2-25-69	16.5	28,000	11 -7-69	9.80	1,280
MILL CREEK NEAR YUCAIPA	38	1919-38 1947-	USGS	1-25-69	14.5(E)	35,400	11 -7-69	7.03	136
LYTLE CREEK NEAR FONTANA	46	1918-	USGS	1-25-69	15.0(A)	35,900	2-28-70	5.32	150
CAJON CREEK NEAR KEENBROOK	41	1919-	USGS	3- 2-38	26.0(C)	14,500	3 -1-70	4.62	550
SANTA ANA RIVER AT RIVERSIDE NARROWS NEAR ARLINGTON	850	1927-	USGS	3- 2-38	- - -	100,000	3 -2-70	6.76	1,670
SAN JACINTO RIVER NEAR SAN JACINTO	141	1920-	USGS	2-16-27	- - -	45,000	3 -2-70	11.52	288
SANTIAGO CREEK AT MADJESKA	13	1961-	USGS	2-25-69	6.2	6,520	3 -2-70	3.11	90
SANTIAGO CREEK AT SANTA ANA	95	1929-	USGS	2-25-69	9.1	6,600	3 -2-70	5.60	1,110
SAN JUAN CREEK NEAR SAN JUAN CAPISTRANO	106	1928-	USGS	2-25-69	5.6(A)	22,400	3 -2-70	3.05	135
SANTA MARGARITA RIVER NEAR TEMECULA	588	1923-	USGS	2-16-27	14.6	25,000	3 -2-70	6.77	2,100
SANTA MARGARITA RIVER AT YSIDORA	739	1923-	USGS	2-16-27	16.0(C)	33,600	3 -2-70	11.15	1,940
SAN LUIS REY RIVER AT MONSERATE NARROWS NR PALA	375	1938-41 1946	USGS	2- 7-37	8.7(C)	-	3 -2-70	4.82	90
SAN LUIS REY RIVER NEAR BONSALL	512	1916-18 1929-	USGS	3- 2-38	16.0	19,100	3 -2-70	7.44	195
SANTA YSABEL CREEK NEAR RAMONA	112	1912-23 1943-	USGS	1-27-16	14.0(C)	28,400	3 -5-70	3.09	83
SANTA YSABEL CREEK NEAR SAN PASQUAL	128	1905-	USGS	3-24-06	6.3(C)	8,000	3 -5-70	2.34	90
SAN DIEGO RIVER NEAR SANTEE	377	1912-	USGS	1-27-16	25.1(C)	70,200	3 -5-70	5.24	706
SWEETWATER RIVER NEAR DESCANSO	45	1905-27 1956-	USGS	2-16-27	13.2(AC)	11,200	3 -5-70	4.02	48
TIJUANA RIVER NEAR DULZURA	4[illegible]1	1936	USGS	2- 7-37	9.[illegible]	4,700	3 -5-70	[illegible]	21

TABLE 3 (CONTINUED)

STREAM AND STATION	DRAINAGE AREA IN SQ MILES	PERIOD OF RECORD	SOURCE OF RECORD	PREVIOUS MAXIMUM OF RECORD: DATE	PREVIOUS MAXIMUM OF RECORD: STAGE IN FEET	PREVIOUS MAXIMUM OF RECORD: DISCHARGE IN CFS	1969-1970 WATER YEAR: DATE	1969-1970 WATER YEAR: STAGE IN FEET	1969-1970 WATER YEAR: DISCHARGE IN CFS
CENTRAL VALLEY AREA									
SACRAMENTO RIVER AT DELTA	425	1944-	USBR	12-22-64	20.1	35,800	1-23-70	16.18	26,600
PIT RIVER NEAR BIEBER	2475	1904-	USGS	3-19-07	16.7	33,800	1-24-70	13.92	22,000
PIT RIVER BELOW PIT NO.4 DAM	4647	1922-	USGS	12-12-37	17.9	30,200	1-25-70	18.10•	32,500•(E)
SQUAW CREEK ABOVE SHASTA LAKE	64	1944-	USBR	12-21-55	21.9	17,800	STATION DISCONTINUED		
MCCLOUD RIVER ABOVE SHASTA LAKE	604	1945-	USBR	12-22-55	28.2	45,200	1-23-70	26.90	37,000
SACRAMENTO RIVER AT KESWICK	6468	1938-	USGS-DWR	2-23-40	47.2(C)	18[illegible],000	1-24-70	32.23	79,000
CLEAR CREEK AT FRENCH GULCH	115	1950-	USGS	12-22-64	13.7	7,600	1-23-70	11.06	4,920
CLEAR CREEK NEAR IGO	228	1940-	USGS	12-21-55	13.8	24,500	1-26-70	8.73	8,260
COW CREEK NEAR MILLVILLE	425	1949-	USGS	12-27-51	21.6	45,200	12-19-69	18.17	36,500
COTTONWOOD CREEK NEAR COTTONWOOD	922	1940-	USGS	12-22-64	19.6	56,500	1-24-70	19.46•	58,500•
BATTLE CREEK BELOW COLEMAN FISH HATCHERY NEAR COTTONWOOD	356	1961-	USGS	12-11-37	15.8(AC)	35,000	1-24-70	14.12	24,000
SACRAMENTO RIVER AT BEND BRIDGE	--	1960	DWR	12- -64	55.0(E)	-	1-24-70	48.28	158,000
PAYNES CREEK NEAR RED BLUFF	93	1949-	USGS	12- 1-61	11.3	10,600	1-24-70	10.26	8,120
RED BANK CREEK NEAR RED BLUFF	94	1959-	USBR-DWR	1- 5-65	10.2	12,200	1-23-70	10.01	8,870
ANTELOPE CREEK NEAR RED BLUFF	123	1940-	USCE	2-22-56	12.4	11,500	1-23-70	17.95•	17,200•
ELDER CREEK NEAR PASKENTA	93	1948-	USGS	2-24-58	13.9	11,700	1-24-70	13.20	11,000
ELDER CREEK AT GERBER	136	1949-	USBR	1- 5-65	14.9	14,100	STATION DISCONTINUED		
MILL CREEK NEAR LOS MOLINOS	131	1909-	USGS	12-11-37	23.4(A)	23,000	1-23-70	15.73	17,000
THOMES CREEK AT PASKENTA	194	1920-	USGS-DWR	12-22-64	15.3	37,300	1-23-70	12.00	18,000
DEER CREEK NEAR VINA	208	1911-	USGS-DWR	12-10-37	19.2(A)	23,800	1-23-70	15.03	20,000
SACRAMENTO RIVER AT VINA BRIDGE	-	1945-	USBR-DWR	12-23-64	90.9	163,000(E)	1-24-70	91.48•	168,000•
SACRAMENTO RIVER AT HAMILTON CITY	-	1945-	USBR-DWR	12-11-37	150.7	350,000	1-24-70	50.77	164,000
BIG CHICO CREEK NEAR CHICO	73	1930-	USGS	1- 5-65	15.4	9,580	1-24-70	15.10	9,260
STONY CREEK NEAR FRUTO	599	1901-12 1960-	USGS	12-23-64	15.5	40,200	1-24-70	15.02	32,000
STONY CREEK NEAR HAMILTON CITY	777	1940-	USGS	2-25-58	18.3	39,900	1-25-70	12.61	12,500
SACRAMENTO RIVER AT ORD FERRY	-	1921-	DWR	2-28-40	121.7	370,000	1-24-70	119.79	265,000(G)
SACRAMENTO RIVER AT BUTTE CITY	-	1921-	USGS-DWR	2- 7-42	96.9	170,000	1-25-70	95.94	152,000

TABLE 3 (CONTINUED)

STREAM AND STATION	DRAINAGE AREA IN SQ MILES	PERIOD OF RECORD	SOURCE OF RECORD	PREVIOUS MAXIMUM OF RECORD DATE	PREVIOUS MAXIMUM OF RECORD STAGE IN FEET	PREVIOUS MAXIMUM OF RECORD DISCHARGE IN CFS	1969-1970 WATER YEAR DATE	1969-1970 WATER YEAR STAGE IN FEET	1969-1970 WATER YEAR DISCHARGE IN CFS
CENTRAL VALLEY AREA (CONTINUED)									
MOULTON WEIR SPILL TO BUTTE BASIN	-	1935-	DWR	2-20-58 2-26-58	83.7	36,000(B) 36,000(B)	1-25-70	83.62	36,400*(B)
COLUSA WEIR SPILL TO BUTTE BASIN	-	1935-	DWR	2- 8-42	70.4	86,000(B)	1-25-70	63.39	76,000(B)
SACRAMENTO RIVER AT COLUSA	-	1940-	USGS-DWR	2- 8-42	69.2	49,000	1-25-70	67.61	48,400
COLUSA BASIN DRAIN AT HIGHWAY 20	-	1924-	DWR	2-21-58	51.9	25,400(E)	1-25-70	50.31	4,170
BUTTE CREEK NEAR NEAR CHICO	147	1930-	USGS	12-22-64	14.1	21,200	1-24-70	13.40	15,000
BUTTE SLOUGH NEAR MERIDIAN	--	1968	DWR	- - -	- - -	-	1-26-70	61.54(E)	152,000(E)
SUTTER BYPASS AT LONG BRIDGE	-	1914-	DWR	3- 1-40	57.7	210,000	1-26-70	56.00	152,000(E)
TISDALE WEIR SPILL TO SUTTER BYPASS	-	1940-	DWR	3- 1-40	53.4	257,00 (B)	1-26-70	50.82	17,100
SACRAMENTO RIVER BELOW WILKINS SLOUG	-	1938-	USGS	2-27-58	51.4	26,900	12-23-69	47.64	27,600
SACRAMENTO RIVER AT KNIGHTS LANDING	-	1940-	USGS-DWR	12- 3-60 12- 8-42	30.3 41.8(D)	30,000	1-26-70	40.86	30,800
MIDDLE FORK FEATHER RIVER NEAR CLIO	686	1925-	USGS	2- 1-63	16.2	14,500	1-24-70	13.56	8,340
MIDDLE FORK FEATHER RIVER NEAR MERRIMAC	1062	1951-	USGS	12-22-64	26.5(A)	86,200	1-24-70	17.48	28,600
NORTH FORK FEATHER RIVER NEAR PRATTVILLE	493	1905-	USGS	3-19-07	16.2(C)	10,000	1-29-70	4.79	600
BUTTE CREEK BELOW ALMANOR-BUTTE CREEK TUNNEL NR PRATTVILLE	69	1936-	USGS	12-23-64	5.8	3,830	1-23-70	4.93	3,830
INDIAN CREEK NEAR CRECENT MILLS	739	1906-	USGS	3-19-07	20.2(C)	25,000	1-17-70	11.24	8,230
SPANISH CREEK ABOVE BLACKHAWK CREEK AT KEDDIE	184	1933-	USGS	12-22-64	13.5	15,400	1-14-70	11.25	10,700
NORTH FORK FEATHER RIVER AT PULGA	1953	1910-	USGS	12-22-64	35.8	73,000(H)	1-23-70	31.24	56,000
WEST BRANCH FEATHER RIVER NEAR PARADISE	113	1957-	USGS-DWR	12-22-64	26.2	25,500	1-24-70	23.4	21,300
FEATHER RIVER AT OROVILLE	3626	1901-	USGS-DWR	3-19-07	39.3(C)	230,000	STATION DISCONTINUED		
FEATHER RIVER NEAR GRIDLEY	-	1929-	DWR	12-23-55	102.3	-	1-27-70	92.81	69,300
SOUTH HONCUT CREEK NEAR BANGOR	31	1950-	USGS	12-26-64	19.3	17,000	1-14-70	9.37	3,890
FEATHER RIVER AT YUBA CITY	-	1944-	DWR	12-24-55	82.4	-	1-24-70	67.63	- - - (L)
MIDDLE YUBA RIVER ABOVE OREGON CREEK	162	1940-	USGS	1-31-63	18.6	31,600	STATION DISCONTINUED		
OREGON CREEK NEAR NORTH SAN JUAN	34	1911-	USGS	12-22-64	12.9	10,300	STATION DISCONTINUED		
NORTH YUBA RIVER BELOW GOODYEARS BAR	250	1930-	USGS	2- 1-63	23.8(A)	40,000	1-22-70	16.40	19,200
NORTH YUBA RIVER BELOW BULLARDS BAR DAM	487	1940-	USGS	12-22-64	40.5	91,600	1-22-70	35.29	59,900
SOUTH YUBA RIVER NEAR CISCO	52	1942-	USGS	1-31-63	20.6(A)	18,400	1-21-70	11.92	6,230

TABLE 3 (CONTINUED)

STREAM AND STATION	DRAINAGE AREA IN SQ MILES	PERIOD OF RECORD	SOURCE OF RECORD	PREVIOUS MAXIMUM OF RECORD			1969-1970 WATER YEAR		
				DATE	STAGE IN FEET	DISCHARGE IN CFS	DATE	STAGE IN FEET	DISCHARGE IN CFS
CENTRAL VALLEY AREA (CONTINUED)									
SOUTH YUBA RIVER AT JONES BAR NEAR GRASS VALLEY	310	1940-48 1959-	USGS	12-22-64	25.0	53,600	1-22-70	16.69	18,200
YUBA RIVER AT ENGLEBRIGHT DAM	1109	1941-	USGS-PGE	12-22-64	546.0(F)	171,700(H)	1-21-70	540.21	93,500(B,H)
DEER CREEK NEAR SMARTVILLE	85	1935-	USGS	10-13-62	13.8	11,600	1-21-70	10.73	6,550
YUBA RIVER NEAR MARYSVILLE	1340	1940-	USGS	12-23-64	90.2	180,000	1-22-70	84.46	106,000
BEAR RIVER NEAR WHEATLAND	292	1928-	USGS	12-22-55	19.3(C)	33,000	1-22-70	13.2	19,700
FEATHER RIVER AT NICOLAUS	5923	1943-	USGS-DWR	12-23-55	51.6	357,000	1-22-70	46.81	146,000
FREMONT WEIR(WEST END) SPILL TO YOLO BYPASS	-	1935-	DWR	12-23-55	39.7	293,800(B)	1-25-70	39.17	223,800(B)
SACRAMENTO RIVER AT VERONA	-	1929-	USGS-DWR	3- 1-40	41.2	79,200	1-26-70	39.21	77,300
SACRAMENTO WEIR SPILL TO YOLO BYPASS NEAR SACRAMENTO	-	1939-	USGS-DWR	3-26-28	31.8	118,000(B)	1-24-70	31.61	22,400(B)
NORTH FORK AMERICAN RIVER AT NORTH FORK DAM	343	1941-	USGS	12-23-64	11.9	65,400	1-21-70	9.04	38,200
RUBICON RIVER NEAR FORESTHILL	311	1958-	USGS	12-23-64	74.0(AI)	-	1-21-70	14.6	15,100
MIDDLE FORK AMERICAN RIVER NEAR FORESTHILL	534	1958-	USGS	12-23-64	69.0(AI)	-	1-21-70	16.6	34,600
MIDDLE FORK AMERICAN RIVER NEAR AUBURN	613	1911-	USGS	12-23-64	60.4(A)	250,000(I)	1-21-70	26.40	37,200
SOUTH FORK AMERICAN RIVER NEAR CAMINO	501	1922-	USGS-PGE	12-23-55	32.6(A)	49,800	1-21-70	23.2	24,400
SOUTH FORK AMERICAN RIVER NEAR LOTUS	673	1951-	USGS	12-23-55	21.4	71,800	1-21-70	15.59	32,700
AMERICAN RIVER AT FAIR OAKS	1888	1904-	USGS	12-21-50	31.9(C)	180,000	1-19-70	12.62	56,700
SACRAMENTO RIVER AT SACRAMENTO	23530	1879-	USWB-DWR	11-21-50	30.1(C)	104,000	1-24-70	24.24	94,100
SACRAMENTO RIVER AT WALNUT GROVE	-	1929-	DWR	11-21-50	13.0(C)	- -	1-23-70	12.1[illegible]	- - - (D)
ADOBE CREEK NEAR KELSEYVILLE	6	1954-	USGS	12-22-64	9.1	1,500	1-23-70	8.81	1,500
KELSEY CREEK NEAR KELSEYVILLE	37	1946-	USGS	12-21-55	12.8	8,800	1-23-70	13.04	7,960
CACHE CREEK NEAR LOWER LAKE	528	1944-	USGS	2-24-58	9.4	9,000	1-23-70	8.60	6,320
NORTH FORK CACHE CREEK NEAR LOWER LAKE	198	1930-	USGS	12-11-37	14.0(A)	20,300	1-23-70	11.39	14,200
CACHE CREEK ABOVE RUMSEY	-	1959-	DWR	1- 5-65	21.4	59,000	1-24-70	19.59	[illegible]
CACHE CREEK NEAR CAPAY	1042	1942-	USGS	2-24-58	20.9	51,600	1-24-70	[illegible]	36,200
CACHE CREEK AT YOLO	1138	1903-	USGS	2-25-58	33.1(C)	41,400	1-24-70	[illegible]	[illegible]
YOLO BYPASS NEAR WOODLAND	-	1939-	USGS-DWR	2- 8-42	32.0	272,000	1-25-70	[illegible]	[illegible]
DRY CREEK NEAR MIDDLETOWN	6	1959-	USGS	2- 8-60	9.90	3,470	1-23-70	[illegible]	2,630

TABLE 3 (CONTINUED)

STREAM AND STATION	DRAINAGE AREA IN SQ MILES	PERIOD OF RECORD	SOURCE OF RECORD	PREVIOUS MAXIMUM OF RECORD: DATE	PREVIOUS MAXIMUM OF RECORD: STAGE IN FEET	PREVIOUS MAXIMUM OF RECORD: DISCHARGE IN CFS	1969-1970 WATER YEAR: DATE	1969-1970 WATER YEAR: STAGE IN FEET	1969-1970 WATER YEAR: DISCHARGE IN CFS
CENTRAL VALLEY AREA (CONTINUED)									
PUTAH CREEK NEAR WINTERS	6	1930-	USGS-DWR	2-27-40	30.5	81,000	1-24-70	18.85	16,300
YOLO BYPASS NEAR LISBON	-	1914-	DWR	12-25-64	24.7	350,000(E)	1-25-70	23.90	275,000(E)
SACRAMENTO RIVER AT RIO VISTA	-	1906-	USCE-DWR	12-25-55	10.2	- (D)	1-23-70	9.10	- - - (D)
NORTH FORK COSUMNES RIVER NEAR EL DORADO	205	1911-41 1948	USGS	12-23-55	14.8	15,800	1-21-70	11.12	8,140
MIDDLE FORK COSUMNES RIVER NEAR SOMERSET	107	1957-	USGS	2- 1-63	16.2	11,800	1-21-70	11.40	3,880
SOUTH FORK COSUMNES RIVER NEAR RIVER PINES	64	1957-	USGS	2- 1-63	10.9	5,540	1-16-70	5.46	1,880
COSUMNES RIVER AT MICHIGAN BAR	536	1907-	USGS-DWR	12-23-55	14.6	42,000	1-21-70	9.71	16,800
COSUMNES RIVER AT MCCONNEL	724	1941-	USBR-DWR	12-23-55	46.3	54,000	1-22-70	45.56	16,700
COLE CREEK NEAR SALT SPRINGS DAM	20	1927-42 1943-	USGS	12-23-64	10.2	6,140	1-21-70	7.35	2,800
SOUTH FORK MOKELUMNE RIVER NEAR WEST POINT	75	1933-	USGS	12-23-55	14.8(AC)	6,920	1-16-70	8.15	2,560
MOKELUMNE RIVER NEAR MOKELUMNE HILL	544	1901-	USGS	12- 3-50	18.5	33,700	1-21-70	11.96	13,700
MOKELUMNE RIVER AT WOODBRIDGE	661	1924-	USGS	11-22-50	25.6	27,000	1-29-70	22.68	4,720
MOKELUMNE RIVER NR THORNTON(BENSON FERRY)	2045	1959-	DWR	12-24-55	16.0(C)	- (D)	1-23-70	12.76	- - - (D)
BEAR CREEK NEAR LOCKEFORD	48	1930-	USGS	4- 3-58	15.1	2,930	1-14-70	14.08	1,010
SOUTH FORK CALAVERAS RIVER NEAR SAN ANDREAS	118	1950-	USGS	12-23-55	10.3	17,600	1-14-70	9.33	8,730
COSGROVE CREEK AT VALLEY SPRINGS	21	1929-	USGS	12-23-55	9.0	3,240	STATION DISCONTINUED		
DRY CREEK NEAR GALT	329	1926-33 1944-	USBR-DWR	4- 3-58	15.3	24,000	1-22-70	13.91	4,270
MORMON SLOUGH AT BELLOTA	-	1948-	DWR	4- 2-58	20.7	15,400	1-21-70	11.47	7,760
CALAVERAS RIVER NEAR STOCKTON	-	1958-	DWR	4- 4-58	9.2	632	1-21-70	5.77	180
STOCKTON DIVERTING CANAL AT STOCKTON	-	1944-	DWR	4- 4-58	17.2(E)	11,400(E)	1-21-70	12.76	8,150
DUCK CREEK NEAR STOCKTON	-	1950-	DWR	12-24-55	5.8	400	1-21-70	5.39	450
SOUTH FORK STANISLAUS RIVER NEAR LONG BARN	67	1937-	USGS	11-21-50	9.3	4,900	1-21-70	5.53	1,150
STANISLAUS RIVER AT ORANGE BLOSSOM BRIDGE	-	1940-	DWR	11-21-50	30.1	52,000	1-22-70	19.21	18,220
STANISLAUS RIVER AT RIPON	1075	1940-	USGS-DWR	12-24-55	63.3	62,500	1-23-70	58.44	15,400
SOUTH FORK TUOLUMNE RIVER NR OAKLAND RECREATION CAMP	87	1923-	USGS	12-23-55	10.9(A)	11,900	1-16-70	6.79	2,190
MIDDLE TUOLUMNE RIVER AT OAKLAND RECREATION CAMP	74	1916-	USGS	12-23-55	11.1(A)	4,920	1-16-70	5.45	730
TUOLUMNE RIVER AT MODESTO	[illegible]	1878-	USGS-DWR	12- 9-50	69.2	57,000	1-22-70	52.65	8,620

TABLE 3 (CONTINUED)

STREAM AND STATION	DRAINAGE AREA IN SQ MILES	PERIOD OF RECORD	SOURCE OF RECORD	PREVIOUS MAXIMUM OF RECORD			1969-1970 WATER YEAR		
				DATE	STAGE IN FEET	DISCHARGE IN CFS	DATE	STAGE IN FEET	DISCHARGE IN CFS
CENTRAL VALLEY AREA (CONTINUED)									
ORESTIMBA CREEK NEAR NEWMAN	134	1932-	USGS-DWR	4- 2-58	6.6(C)	10,200	1-16-70	5.74	810
MERCED RIVER AT POHONO BRIDGE NEAR YOSEMITE	321	1916-	USGS	12-23-55	21.5(A)	23,400	1-16-70	6.85	2,660
SOUTH FORK MERCED RIVER NEAR EL PORTAL	241	1950-	USGS	12-23-55	18.7	46,500	1-16-70	10.44	5,030
MERCED RIVER NEAR BRICEBURG	691	1965-	USGS	12- 6-66	17.8	21,500	1-16-70	12.40	10,500
MERCED RIVER NEAR STEVINSON	1273	1940-	USBR-DWR	12- 5-50	73.8	13,600	1 -1-70	62.67	1,980
CHOWCHILLA RIVER AT BUCHANAN DAM SITE NEAR RAYMOND	235	1921-23 1930-	USGS-DWR	12-23-55	16.5	30,000	1-16-70	11.28	8,700
FRESNO RIVER NEAR KNOWLES	133	1911-13 1915-	USGS	12-23-55	11.5	13,300	1-16-70	6.46	3,510
FRESNO RIVER NEAR DAULTON	258	1941-	USBR	12-23-55	12.6	17,500	1-16-70	7.80	4,420
WILLOW CREEK AT MOUTH NEAR AUBERRY	130	1952-	USGS	12-23-55	28.5(A)	15,700	1-16-70	14.23	3,910
SAN JOAQUIN RIVER BELOW KERCHOFF POWERHOUSE NEAR PRATHER	1480	1910-	USGS	12-23-55	51.0(A)	92,200	1-17-70	23.76	12,800
SAN JOAQUIN RIVER BELOW FRIANT	1675	1907-	USGS	12-11-37	23.8(C)	77,200	1-16-70	2.56	44
SAN JOAQUIN RIVER NEAR MENDOTA	4310	1939-	USBR	6- 1-52	- - -	6,840	1-23-70	9.47	2,270
EASTSIDE BYPASS NEAR EL NIDO	-	1964-	DWR	2-25-69	17.6	21,690	1-17-70	14.40	5,290
SAN JOAQUIN RIVER AT FREMONT FORD BRIDGE	7619	1937-	USBR-DWR	4- 6-58	74.9	5,910	1-19-70	64.41	3,280
SAN JOAQUIN RIVER NEAR NEWMAN	9524	1912-	USGS-DWR	3- 7-38	65.9	33,000	1-24-70	16.82	30,700
SAN JOAQUIN RIVER NEAR VERNALIS	13540	1922-	USGS	12- 9-50	32.8	79,000	1-23-70	28.52	25,300
KINGS RIVER BELOW NORTH FORK	1342	1951-	USGS	12-23-55	23.1	85,200	1-16-70	9.95	12,600
KAWEAH RIVER AT THREE RIVERS	418	1958-	USGS-DWR	2- 1-63	13.7	30,900	1-26-70	10.32	13,400
TULE RIVER NEAR SPRINGVILLE	225	1957-	USGS	1-31-63	10.8	10,100	1-16-70	9.76	9,650(A)
TULE RIVER BELOW SUCCESS DAM	393	1953-	USGS	12-23-55	21.7(C)	27,000	1-17-70	5.73	429
KERN RIVER AT KERNVILLE	1009	1905-12 1953-	USGS	12- 6-66	19.3(A)	74,000	1 -6-70	10.57	10,400
SOUTHERN LAHONTAN AREA									
MOJAVE RIVER AT LOWER NARROWS NEAR VICTORVILLE	530	1899-06 1930-	USGS	3- 2-38	15.7	70,600	2-24-70	2.99	559
MOJAVE RIVER AT BARSTOW	-	1930-	USGS	3- 3-38	8.6	64,300			NO PEAK
MOJAVE RIVER AT AFTON		1929-32 1952-	USGS	12-31-65	7.9	4,150			NO PEAK

TABLE 3 (CONTINUED)

STREAM AND STATION	DRAINAGE AREA IN SQ MILES	PERIOD OF RECORD	SOURCE OF RECORD	PREVIOUS MAXIMUM OF RECORD			1969-1970 WATER YEAR		
				DATE	STAGE IN FEET	DISCHARGE IN CFS	DATE	STAGE IN FEET	DISCHARGE IN CFS
NORTHERN LAHONTAN AREA									
WILLOW CREEK NEAR SUSANVILLE	93	1950-	USGS	2- 1-63	5.6	816	1-23-70	5.54	795
SUSAN RIVER AT SUSANVILLE	192	1900-	USGS	12-22-64	7.3	5,100	1-24-70	8.69	5,650
LITTLE TRUCKEE RIVER ABOVE BOCA RESERVOIR NEAR BOCA	146	1903-10 1939-	USGS	2- 1-63	9.0	13,300	6 -5-70	2.00	463
TRUCKEE RIVER AT FARAD	932	1899-	USGS	11-21-50	14.5(A)	17,500	1-21-70	8.49	6,430
EAST FORK CARSON RIVER BELOW MARKLEEVILLE CREEK	276	1960-	USGS	1-31-63	8.2	15,100	1-21-70	5.93	3,040
WEST FORK CARSON RIVER AT WOODFORDS	66	1900-	USGS	2- 1-63	9.0	4,890	1-22-70	3.62	830
WEST WALKER RIVER BELOW LITTLE WALKER RIVER NEAR COLEVILLE	180	1938-	USGS	11-20-50	8.1	6,220	6 -4-70	4.28	1,490
EAST WALKER RIVER NEAR BRIDGEPORT	359	1921-	USGS	6-19-63	4.6	1,390	1-17-70	3.50	860

LEGEND

- USGS - UNITED STATES GEOLOGICAL SURVEY.
- USBR - UNITED STATES BUREAU OF RECLAMATION.
- USWB - UNITED STATES WEATHER BUREAU.
- USCE - UNITED STATES CORPS OF ENGINEERS.
- DWR - DEPARTMENT OF WATER RESOURCES.
- PG+E - PACIFIC GAS AND ELECTRIC COMPANY.
- A - FROM FLOOD MARKS.
- B - DISCHARGE OVER WEIR OR SPILLWAY.
- C - SITE OR DATUM THEN IN USE.
- D - DISCHARGE NOT DETERMINED, AFFECTED BY BACKWATER OR TIDE.
- E - ESTIMATED.
- F - FROM DWR TELEMETERING LOG.
- G - PRELIMINARY.
- H - INCLUDES FLOW THROUGH POWER HOUSE.
- I - DUE TO FAILURE OF PARTIALLY COMPLETED DAM.
- $\boxed{\text{• - PEAK OF RECORD.}}$

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